

DISTR0



053113 #93

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BRAINSTORM

**OVER THE COURSE OF FOUR DAYS,
A CROSS SECTION OF WORLD VISIONARIES,
FROM TONY ROBBINS TO VINT CERF,
CONVERGED WITH ONE GOAL IN MIND:
CREATE THE NEXT XPRIZE**

**SAMSUNG'S SOLID
ATIV BOOK 7**

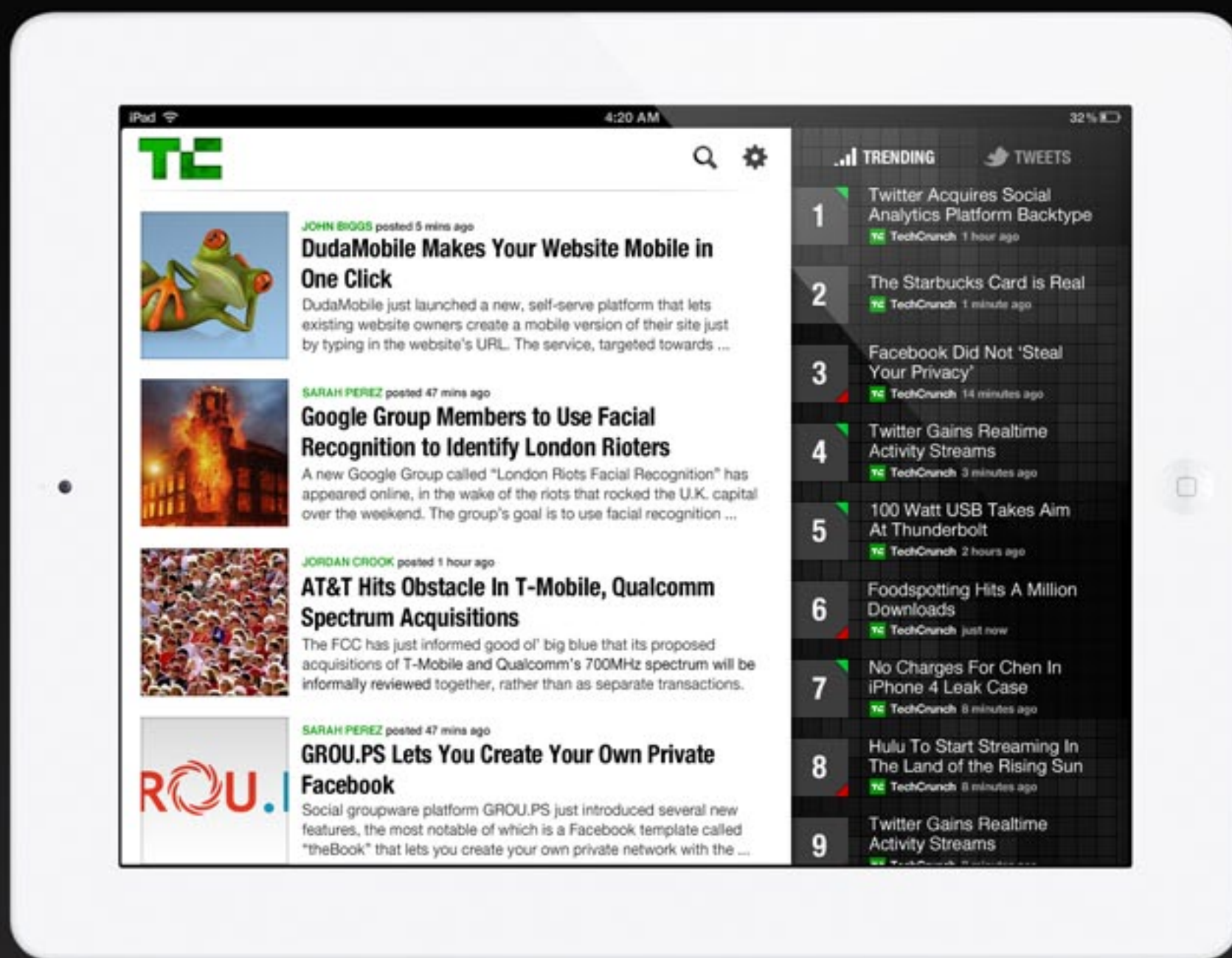
**GOOGLE X LAB'S
THAD STARNER ON
AUGMENTED REALITIES**

**HUAWEI'S MASSIVE
ASCEND MATE**



TechCrunch

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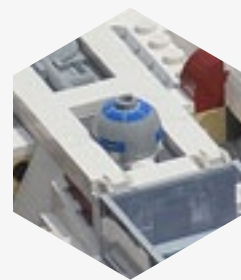
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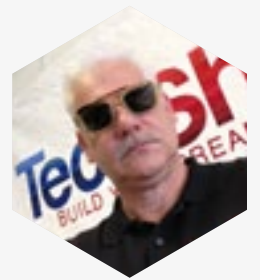
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WINDOWS 8 GETS ITS START BACK

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EDITOR'S
LETTER

There are times when you need to stay strong, ignore the criticism and do what you know is right. Then, there are some times when the masses are right and listening is the smart thing. With Windows 8, Microsoft made many radical changes, not the least of which being the deletion of the fabled Start button. This week we got our first taste of that operating system's first major update, Windows 8.1, and it includes a number of notable upgrades and improvements. Perhaps the most notable? The return of a Start button. Well, sort of.

It's now called a "Start Tip" as it isn't a proper button, but you can click on it and bring up the tiled Start Screen interface. So, the Start *button* is back, but not the Start *menu*. That's fine by me, as I don't think hidden, contextual elements make much sense in a keyboard-and-mouse environment. And the other tweaks are nice, including a far more comprehensive Settings section, a functional lock screen and, finally, the ability to adjust the size of applications that you've snapped to either side of your screen. Maybe in Windows 8.2 we'll get fully resizable windows!

Tim Cook joined many other notables

speaking at the D11 conference and, as he often does, dropped a lot of interesting sound bites and factoids. First off, he said that wearable devices are "incredibly exciting," but thinks that Google Glass is not something that will have "broad-range appeal." The glasses form factor, he thinks, will be something many users won't want to commit to. He then, coyly, went on to say that he enjoys the wrist-worn Nike FuelBand — as if you needed any more indication of where Apple's own wearable will go on your body.

Cook also said that the upcoming WWDC would have a strong focus on iOS and OS X, the expectation being that we'll finally see the retooled mobile operating system. Who knows, maybe OS X will finally step away from the increasingly more obscure cat-based naming system, too. Finally, he indicated that Apple has sold a whopping 13 million Apple TVs, and that half of those have been sold in the past year alone. Maybe there's room for an actual Apple-branded TV after all.

Motorola is taking the unusual (but thoroughly commendable, in my opinion) step of building its next major smartphone here in the US of A. Fort Worth,



“Cook also said that the upcoming WWDC would have a strong focus on iOS and OS X.”


Texas, specifically, at a factory formerly used by Nokia, making it the first Motorola smartphone built here. The phone is coming later this summer and will be called the Moto X, a name that gives me all sorts of wonderful ideas for an adrenaline-filled marketing campaign.

Lenovo, meanwhile, announced that it would finally be bringing its growing stable of smartphones to the American market sometime before the end of the year. It's a hugely competitive market, CEO Yang Yuanqing acknowledged to *The Wall Street Journal*, but with PC sales sliding, it's one that his company can't afford to ignore.

LG, meanwhile, finally showed off its white Nexus 4 officially — a phone that we unofficially got our hands on at I/O two weeks ago. It launched this week and it might just mark the company's final Nexus device. For now, anyway. European VP Kim Wong said LG “does not need such a marketing success again,” which we'll take to mean that the company thinks it can do just fine with its own custom skin. Stock Android, we're told, is unfortunately not in the immediate future for devices.

With the buzz surrounding the Xbox

One settling down after last week, hype machines surely taking a bit of a breather ahead of E3 in a few weeks' time, Sony Worldwide Studios boss Shuhei Yoshida decided it's a fair time to get people talking about the PlayStation 4 again. More specifically, about how it works with the PlayStation Vita. Games for Sony's next home console will *all* run on the Vita via Remote Play — excepting those games that depend on Move or other specific hardware. Additionally, the Vita can be used to deliver a second-screen-like experience, a la the Wii U. However, since not every PS4 owner will have a Vita, we're dubious about just how well integrated that functionality will be.

In this week's Distro, I'm taking you inside the XPRIZE to show you how the philanthropic and forward-thinking organization decides what's worthy of its considerable support. We also have my interview with wearable-computing pioneer Thad Starner about just how Google Glass came to be. There's a pair of reviews: the Samsung ATIV Book 7 and Huawei Ascend Mate; Ross Rubin discusses the state of the BlackBerry keyboard; and TechShop CEO Mark Hatch sits down for Q&A. We hope you'll make us your primary screen for a little while and enjoy. 



TIM STEVENS
EDITOR-IN-CHIEF,
ENGADGET



THE DIY ONE, CREEPY KINECT AND HASWELL CRAVINGS



Touch article names
to read full threads

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INBOX



BUILDING THE XBOX ONE
ISSUE 92,
MAY 24TH, 2013

“How to build an
Xbox One.

Step 1: Find an old VHS
player from the ‘80s

Step 2: Rip all of its
guts out

Step 3: Put PC parts
into it

Step 4: Install 3
operating systems.”

— KANNEDFARU

CAST AR
ISSUE 92,
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“The very best way to kill every VR-like product is for there to be more than one of something as niche as this before it has a chance to take off. Splitting the audience kills a niche product before it has a chance to get off the ground. Then again, perhaps Oculus Rift should have launched (for reals, not the prototype) and they wouldn’t have been upstaged before they got out the door.”

— HISDIVINEORDER

“This is some great-looking industrial design. Finally, something that will fit into an A/V cabinet, and/or that you’d be proud to display. I’m so glad this doesn’t look like a toy for 12 year olds anymore (i.e. Play-Doh).”

— PAUL M

“No one is creeped out by the fact that the Kinect 2.0 can sense your heart-beat? An HD camera with a mic so good it can sense your heartbeat in the center of my home? And it is ‘always on?’”

— XGORDOX



**x86'D: NINTENDO'S
NEXT-GEN PROBLEM**ISSUE 92,
MAY 24TH, 2013

“Nintendo threw their chips in with the casual gaming crowd. It was an explosive and genius idea with the Wii that netted them a ridiculous amount of money.

But they ushered out their hardcore fans in the process, marginalizing them. And who are the ones who would have stuck with your IP the moment all the casual mums and little kids wander off to the new iPad or smartphone markets instead?

The very hardcore, loyal fanbase that Nintendo ignored and sequestered with the Wii. They were too busy grabbing quick bucks off the casual crowd to think long-term on making sure the Wii kept being the next big thing. With Android and iOS devouring handheld sales through pure convenience — I have friends with 3DSes sole-

ly for Pokémon games, that doesn't help third-party developer confidence — the Gameboys aren't the in thing anymore, either.”

— COFFEEGRUNT

“This is a GOOD thing for the Wii U. I already own a machine with an x86 chip that plays next gen games: my computer. If all the next-gen games are going to be the same then the Wii U is actually set apart as something novel and interesting. I've got a PC to play FPS and AAA games on, but I may well buy a Wii U for the ‘different’ options.”

— REDYETI**SOME QUESTIONS ABOUT
THE NEW XBOX ONE**ISSUE 92,
MAY 24TH, 2013

“I hope they make the voice recognition good enough to tell the difference between a conversation about an ‘Xbox One’ and the voice command for ‘Xbox On.’”

— FLAGEZOOKE**THE RISE (AND RISE?)
OF BITCOIN**ISSUE 91,
MAY 17TH, 2013

“There are a finite number of Bitcoins (only 21 million will ever be made). People are hoarding them, and this does make the price go up, but there will never be more than the original 21 million in existence. You can't just print more. However, the Bitcoin unit is infinitely divisible, so it is by definition ‘deflationary.’”

— TAMMYLACROIX**ASUS PADPHONE INFINITY**ISSUE 92,
MAY 24TH, 2013

“How about... release the darn thing in the US.”

— COFFINFEEDEER**ASUS TRANSFORMER
BOOK**ISSUE 92,
MAY 24TH, 2013

“Haswell Haswell Haswell Haswell!!!! My body waits for Haswell!!!”

— MADHAV V KYATSANDRA

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EYES-ON

WREN V5



WIRELESS CRAFTSMANSHIP

Speaker units nowadays are constructed of everything from plastic to porcelain. The folks at Wren have gone the natural route and draped the V5 wireless units in wood veneers with a set of curves and just enough silver to complete the high-end look.

THE DAMAGE: \$399



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EYES-ON

WREN V5



SILVER LINING

A dash of silver lines the speaker grille and controls, contrasting nicely with the wood aesthetics around the sides.

PHOTOGRAPHS BY WILL LIPMAN



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EYES-ON

WREN V5



SHAPE UP

A combination of curves and angles gives these Wren systems a unique form factor that differs from other block-like or circular offerings.

PHOTOGRAPHS BY WILL LIPMAN



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EYES-ON

WREN V5



NATURAL FINISH

Rosewood and bamboo veneers wrap the exterior, lending a natural look to the wireless-audio tech.

PHOTOGRAPHS BY WILL LIPMAN



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HANDS-ON



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HP ENVY ROVE 20

It's official: battery-powered all-in-ones you can schlep around the house are now a thing. First Sony released the Tap 20. Then Lenovo followed with the Horizon and now HP makes three, with its newly announced Envy Rove 20. As the name suggests, it's a 20-inch PC you can move from room to room — if 11.86 pounds can really be considered portable. As with other systems in its class, that IPS, 720p display can lie nearly flat allowing you to use it as more of a tablet / 21st century board game machine. The difference is that there's a button to release the hinge in the back, so you don't

PRICE: TBD

AVAILABILITY: JULY 2013

THE BREAKDOWN: HP CASTS ITS HAT IN THE 20-INCH "PORTABLE" ALL-IN-ONE FRAY WITH THE ENVY ROVE 20.

have to pull it out by hand. Keep in mind, though, that this sophisticated design makes the Rove 20 almost half a pound heavier than the Tap 20. Sorry, you can't have it all.

On the inside, it packs a Haswell chip, with up to 1TB of storage and an 8GB SSD for caching. The built-in battery is rated for close to four hours of life, according to an HP rep, which would be a significant improvement over the Tap 20. Incidentally, it has both WiDi and 802.11ac, neither of which has been included on an HP all-in-one before. There's Beats Audio too, along with a subwoofer. On the software side, meanwhile, HP's pre-installing a few board games like *EA Monopoly*, and there's a physical key you can use to flip the screen orientation when it's another player's turn.





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PRICE: TBD

AVAILABILITY:
2014 (2015
MODELS)

THE BREAKDOWN:
AT&T'S LTE
BRINGS U-VERSE
CONTENT, REMOTE
SURVEILLANCE
AND MORE TO
GM'S CONNECTED
SYSTEM.

LTE-ENABLED ONSTAR CONNECTED VEHICLE

GM and OnStar were on hand at CTIA to demonstrate a few ideas of what their new service could look like once bolstered with AT&T's LTE network. The system, which we originally heard about in February at Mobile World Congress, is still in its infancy, but with all the ideas being bounced around during our whirlwind tour, it's apparent that's changing fast. Without question, big change is what is driving this whole endeavor, specifically adding infotainment to its stalwart safety, security and diagnostics offerings.

GM and OnStar envision a curated app ecosystem with downloadable apps, remote car management (including streaming video to remote devices from your car's onboard cameras), access to

U-Verse and even a built-in hotspot to share with your passengers. Developers will have access to APIs that can interact with the car to grab info about speed, performance, fuel economy and other interesting metrics, but are locked out of anything potentially dangerous. After our brief demo, we came away mostly impressed with what we saw, though we're still unsure if an in-car app ecosystem is a viable thing. Driver distraction issues aside, there are a wealth of devices able to provide all the same services and more often than not, they'll already be in your pockets and in your car. Launch of the 2015 model year cars is still quite a way off, but we'll definitely be tracking the system's progress as it prepares to hit showrooms next year.





MAXWEST IPPO Y88



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It's true that cheap, affordable Android tablets are a dime a dozen at most trade shows these days, but here at CTIA 2013, we stumbled upon something that caught our eye — a 7-inch, dual-core tablet running Jelly Bean that costs just \$65. The Maxwest TAB-7155DC, aka Ippo Y88, measures 182 x 122 x 10mm (7.16 x 4.8 x 0.39 inches), weighs 187g (6.6oz) and comes in several hues (black, white, silver, red, blue and pink).

It features a 7-inch (1,024 x 600) capacitive multitouch LCD, an Infotmic IMAPx820 SoC (1GHz dual-core Cortex-A5 CPU with Mali 400 GPU), 512MB of RAM, 4GB of storage, dual VGA cameras (front and back), 802.11b/g/n and a 2,800mAh battery. The screen isn't covered in glass and there's no sign of any Bluetooth or GPS radios, but then

again, what do you expect for \$65? You'll find a power / lock key, DC socket, micro-USB port (with on-the-go support) and mini-HDMI output on the top edge, plus a 3.5mm headphone jack, volume rocker and microSD card slot on the right side. A microphone and speaker round things out in back.

The tablet runs a mostly stock version of Jelly Bean (Android 4.1.1, to be specific) and includes the usual assortment of Google apps along with access to the Play Store. Performance is adequate — not buttery smooth, but perfectly usable. Build quality and materials are surprisingly de-

cent for the price (the plastic is color-through), but the display leaves a lot to be desired (viewing angles are poor and the acrylic covering the screen is scratch-prone). Then again, it's only \$65, right?

PRICE: \$65

AVAILABILITY: TBD

THE BREAKDOWN: THE \$65 SLATE PERFORMS AS EXPECTED, BUT IT DOES PACK JELLY BEAN AND A DUAL-CORE CHIPSET.





KEVO KEYLESS ENTRY SYSTEM

Kwikset and UniKey are set to update their home entry systems, which have remained largely unchanged since they were first invented more than a hundred years ago.

Using a Bluetooth daughtercard in the lock mechanism, a couple Bluetooth antennas and a clever app, this lock opens by simply touching a finger to the outside of the housing


PRICE: \$199

AVAILABILITY:
TBD

THE BREAKDOWN:
KEVO USES
BLUETOOTH AND
SMARTPHONE
APPS TO SECURE
HOME ENTRY AND
KEY SHARING.

when you approach the door.

At its simplest, the companies' Kevo system isn't too unlike a keyless car entry system, though it takes advantage of your iPhone's Bluetooth LE — Android and BB10 versions will arrive as soon as those platform's stacks are sorted — or the included key fob for the proximity technology. Security is handled through the phone or desktop app enabling you to share keys with your family as administrative users, normal users, one-off entry or even scheduled access.

For those concerned about leaving your phone too near the door and thereby allowing anybody access, the system actually uses two antennas, one on the inside and one out. So should you stand behind the closed door the system won't trigger access to those outside. Battery life for the four AAs is rated for a year, and you've no need to worry about being surprised by an outage, either: the system will notify you well in advance using the lock's eight RGB LEDs or through the app. 



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Xbox One by the Numbers

We doubt you missed it, but Microsoft unveiled its new games console last week, and it even showed off some Xbox One hardware to prove it. While the new name is offering casual gamers a bit of confusion — Google “Xbox One” for a taste — the specs sound like they could make for one very potent console. Billions of transistors? We’re just hoping they ensure there are plenty of Covenant to shoot in the requisite *Halo* sequel. There was a very heavy focus on TV, *Call of Duty* and sports games, so plenty of big-hitter titles to get excited about. But numbers and decimals make us just as happy, so enjoy.

— Mat Smith

COURTESY OF ACTIVISION (CALL OF DUTY DOG)



Five Billion

Transistors in the Xbox One SoC

8

OSes:

three

Processor cores in the Xbox One

3 Processor cores in the Xbox 360

5 Pieces of custom silicon

3

Dedicated 3D Printers in Microsoft's controller workshop

Prototype controllers made during development of the new gamepad

BETWEEN

200

AND

300

THREE HUNDRED THOUSAND

Servers added to Xbox Live

54

Mentions of “TV” or “television” during the Xbox One launch event

1,000

Max friends you can register

6

Exclusive titles promised so far

Infrared pixel depth on Kinect 2.0:

250,000

Number of CGI dogs featured at the event

22,469

Accounts following @CollarDuty (the *Call of Duty* dog) since it started tweeting on May 21st

21:00

Minutes devoted to *Call of Duty* at the Xbox reveal



Inside Google's Secret Lab

By Brad Stone
Bloomberg Businessweek



One of the most revealing looks yet at Google's secretive X Lab, this piece from Brad Stone for *Bloomberg Businessweek* examines not just the technology that's been spun out — most famously the company's self-driving car and Glass wearable computer — but the culture that's emerged within it. One tradition involves a formal graduation ceremony, with team members awarded diplomas and mortarboards emblazoned with the letter X when a project is completed or moves on from the lab. Stone also profiles some of the lab's key figures, including Astro Teller, who spearheaded Google's recent acquisition of Makani Power (a startup working on flying wind turbines), and Sebastian Thrun, who's behind the company's self-driving car and a co-founder of the lab itself.

COURTESY OF GOOGLE

The Internet is Under Attack: Ron Deibert on the Closed-Down Web
By Clive Thompson
Hazlitt

In this interview for *Hazlitt*, Clive Thompson talks to the Citizen Lab director and author of *Black Code*, Ron Deibert, about what he sees as threats to the open nature of the internet — from the increasing prevalence of denial-of-service attacks to governments more willing to filter the internet or simply shut things down.

Bowling with God: Vint Cerf Talks Time Travel, Porn, and Web Addiction
By Jeff Jetton and Erik Stallman, *Gizmodo*

As you can probably surmise from the title, this is a fairly wide-

ranging interview with Vint Cerf — co-inventor of the TCP/IP protocol and one of the fathers of the internet — covering the gamut from DARPA to environmentalism to his daily internet use to *War Games* and *Dune*. There is also bowling, but not much discussion of it.

A Legacy Feud in Tech
By Quentin Hardy
The New York Times

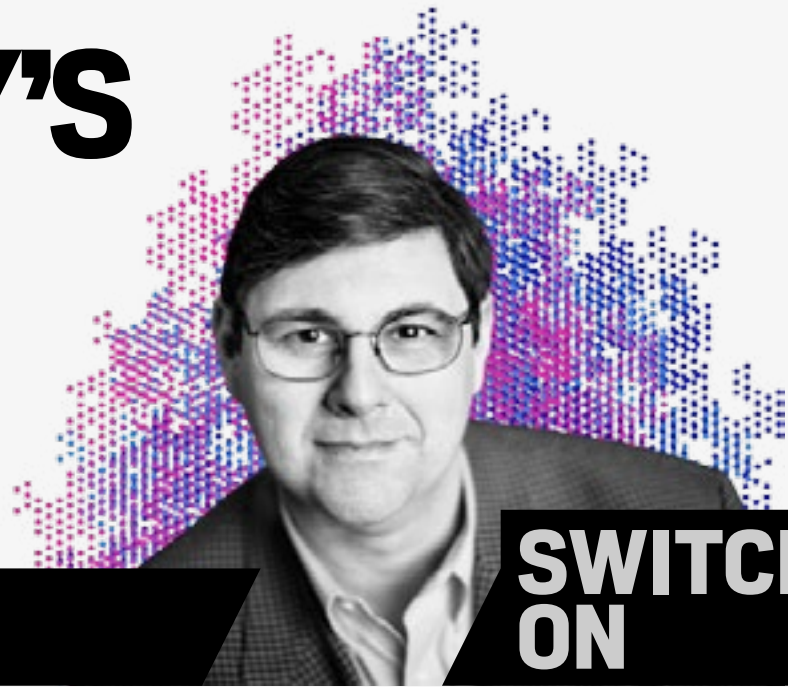
A look at a legendary Silicon Valley rivalry that could be set to repeat itself, with two protégés of Oracle's Larry Ellison and PeopleSoft's David Duffield — Zachary Nelson and Aneel Bhusri of NetSuite and Workday, respectively — now running companies competing in cloud computing services.



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BLACKBERRY'S DEPRESSING KEYBOARD TRENDS



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FORUM

SWITCHED
ON

BY ROSS RUBIN

IN A MARCH INTERVIEW, GOOGLE CHAIRMAN Eric Schmidt, whose company's smartphone ambitions led to his vacating a board seat at Apple, claimed that he didn't use either an Android phone or iPhone. Rather, he uses a Blackberry, citing his affinity for its keyboard despite a number of Android models released over the years integrating physical thumb keyboards.

RIM devices had keyboards even before they had email; the feature was part of the BlackBerry's predecessor, the RIM Inter@ctive Pager. Indeed, tactile feedback was so valued by the company that it tried to integrate it into the touchscreen with the BlackBerry Storm. In reviewing that phone for *The New York Times*, David Pogue noted, "A BlackBerry without a keyboard is like an iPod without a scroll wheel." Imagine such a thing.

Indeed, like the click wheel, the keyboard has faded quickly from that

landscape. According to Mobile Phone Track, a consumer purchase-tracking service of The NPD Group, handsets with physical keyboards accounted for 61 percent of smartphone sales in the first quarter of 2010. That percentage had halved a year later and dropped to just 21 percent in the first quarter of 2012. In the first quarter of 2013, just 7 percent of smartphones had keyboards.

The keyboard was more likely a victim of BlackBerry's fall from grace rather than consumer preference turning



“BlackBerry still believes in the power of physical keyboards, teeing up the Q10 as one of its BB10 launch devices.”

against the keyboard per se and thus hurting the company's sales. If one is used to typing on a physical keyboard, typing on a touchscreen can be inaccurate and unsatisfying at first.


However, many acclimate over time. Besides, as phone screens have pushed past the 4-, 5- and now even 6-inch barriers, keyboards have gotten larger. And we've seen third-party add-ons for Android in Swype and SwiftKey that can greatly accelerate text entry on such touchscreens. And while it may not be discreet to dictate in many circumstances, voice is clearly playing a growing role in all major smartphone operating systems.

BlackBerry still believes in the power of physical keyboards, teeing up the Q10 as one of its BB10 launch devices and recently introducing the lower-cost Q5. But the Z10, which lacks a physical keyboard, was the first to market for the newly renamed smartphone company.

At the introduction of the iPhone, Steve Jobs made what was, at the time, considered a controversial stand against physical smartphone keyboards

BlackBerry
broadens its
QWERTY line
with the new
budget-priced
Q5.



just as he would years later against larger devices at the iPad introduction. Dismissing their value on products such as the Palm Treo, Motorola Q, Nokia E62 and BlackBerry Pearl, he noted that “they all have these keyboards that are there whether you need them or not to be there.” It's clear that, for many, the value that physical keyboards bring is worth the screen real estate sacrifices even when they're not needed. However, for BlackBerry to grow meaningfully, its phones will need to resonate with those who have pressed Escape on the smartphone's keyboard. 



REVIEW

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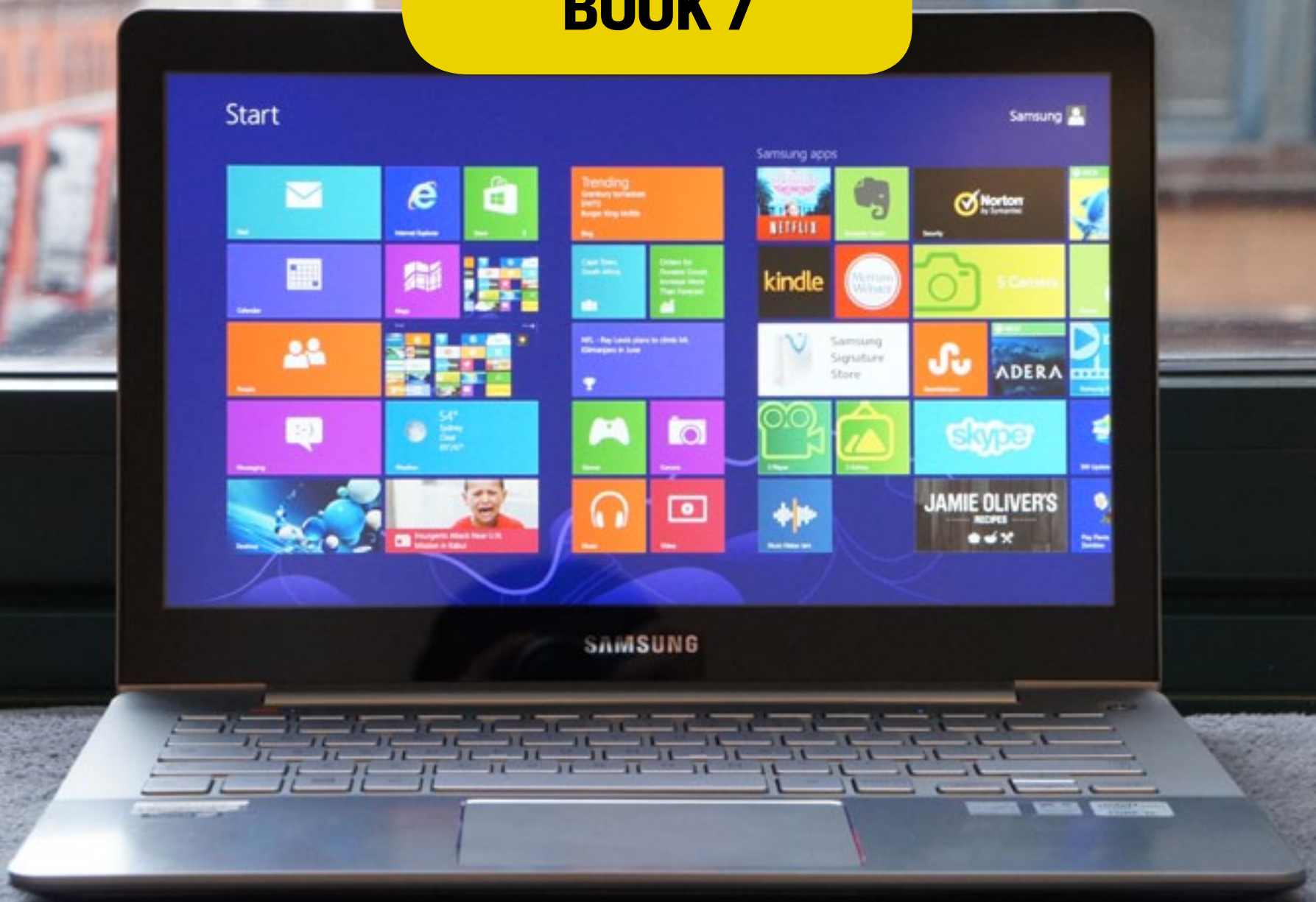
**Samsung
ATIV
Book 7**



**Huawei
Ascend
Mate**



SAMSUNG ATIV BOOK 7



The **ATIV Book 7** boasts solid hardware and specs with a stylish design, but will its heft and last-gen CPU prevent a smashing success?
By Dana Wollman

If you've been waiting for Samsung to refresh last year's Series 9 Ultrabook, don't hold your breath; apart from a recent upgrade to 1080p resolution, it's basically stayed the same. That doesn't mean Samsung is taking a break from ultraportables, though: the company recently started shipping the Series 7 Ultra (now called the ATIV Book 7), which debuted at CES. Regardless of the name, the idea was always for it to be part of Samsung's performance line, ranking right below the flagship Series 9 family. To that end, it ships for \$1,060 with all the specs you'd expect to find in a mid- to



high-end Ultrabook: a Core i5 processor, 4GB of RAM, a 128GB SSD, a 13.3-inch (1080p) display and a stronger set of speakers than on the Series 9. Obviously, the fact that it's launching with Ivy Bridge is one knock against it, but how does it stack up otherwise? Might it be a good deal if it ever gets a CPU refresh?

LOOK AND FEEL

The ATIV Book 7 was announced at the same time as the Series 7 Chronos (now called the ATIV Book 8) and so, it shares much of the same design language, from the aluminum chassis to the metal keys and brushed texture. As with the higher-end Series 9, Samsung went easy on the gaudy touches: all you'll find here in the way of adornment is a flush power button above the keyboard, a small orange JBL logo and a thin band of chrome ringing the trackpad. The difference, of course, is that the ATIV Book 7 doesn't feel quite as high-end — not that it was ever intended to be. Don't get us wrong: it's still a pretty machine, with clean lines and a modern feel. But with a lid that flexes slightly and a chassis that widens to a relatively thick 0.74 inch, it's not as sexy as its big brother — nor as

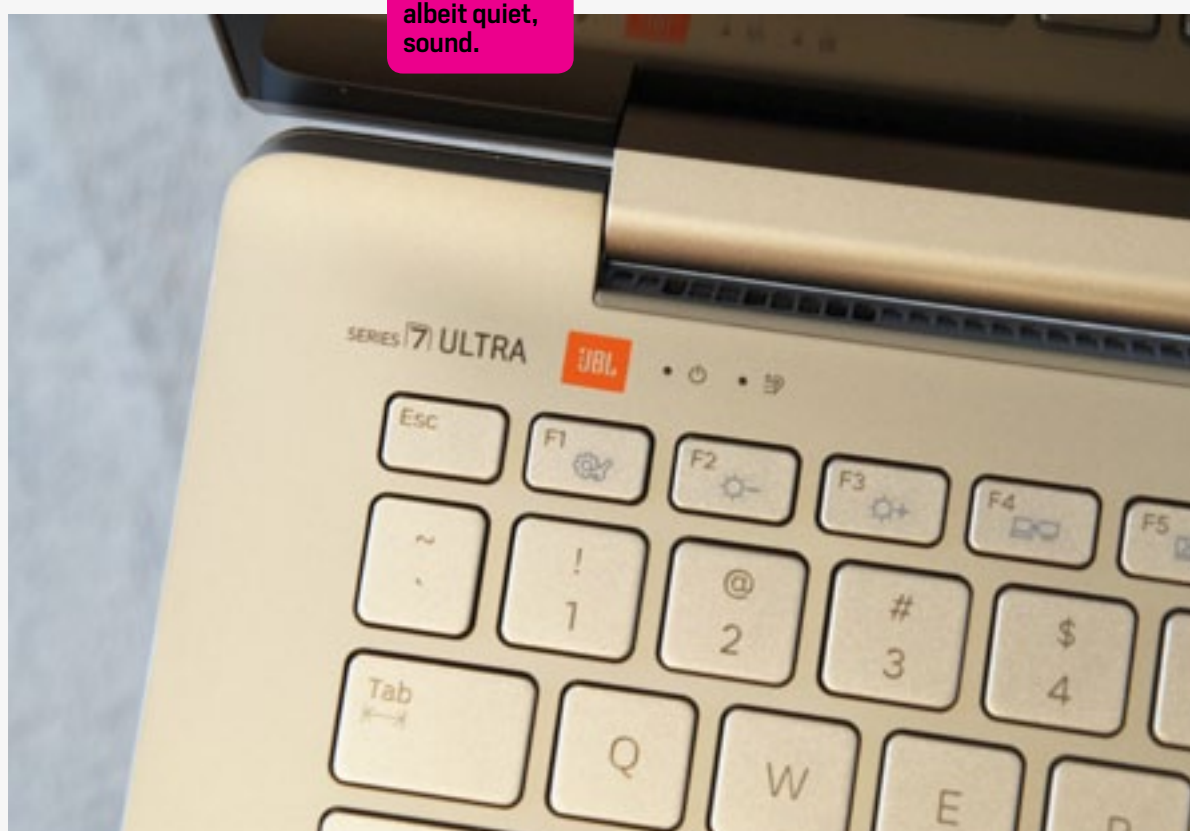
Samsung went easy on the gaudy touches.

well-made, for that matter.

Also, the ATIV Book 7 is heavier — much heavier. At 3.64 pounds, it's about a third of a pound heavier than other touchscreen 13-inch models, like the Lenovo IdeaPad Yoga 13. Particularly after testing Toshiba's 2.9-pound Kirabook, the ATIV Book 7 feels unnecessarily heavy. We can't see a reason for this to be on the bad side of three and a half pounds: there's no optical drive on board, and no discrete GPU. This has basically the same specs as other 13-inch Ultrabooks, and yet there's something about the design that weighs it down. (Spoiler alert: it ain't a heavy-duty battery, that's for sure.)

At least it makes room for a lot of ports. On board,

The JBL innards offer a balanced, albeit quiet, sound.



you'll find an Ethernet jack crammed in, with a drop-down panel at the bottom to create more space when you actually need to wedge a cable in there. There are also three USB ports (one 3.0, two 2.0), along with an HDMI socket, a headphone jack, a Kensington lock slot and an SD card reader. There's also a proprietary port you can use to connect an optional VGA dongle, so feel free to ignore it if you don't end up buying the add-on.

KEYBOARD AND TRACKPAD

We're not sure how Samsung did it, but it managed to produce an Ultrabook keyboard where barely any of the keys had to be cut down in size. Everything from the Shift to the Backspace to the Enter button is amply sized, and easy to hit without looking. Even the arrow keys are pretty big, and that's usually the first area to be compromised when companies are looking to save space. What's funny, too, is that there's still plenty of unused space on either side of the keyboard, which creates the illusion that Samsung actually had room to spare.

If anything, we wish the keys had



Chrome rings the trackpad adding a bit of flair to the ATIV Book 7.

a bit more travel — which they totally could have, seeing as how Samsung's priority *clearly* wasn't to build the thinnest-ever laptop. It's not a dealbreaker, by any means — most Ultrabooks have flat keyboards — but there were a few instances where I had to re-enter a letter after my press failed to register. I also felt myself hitting the keys with a little more pressure than I normally would, probably because I didn't trust that my presses would go through.

As befits a high-end machine, the

The trackpad here is the best we've tested in recent memory.



ATIV Book 7 has backlighting on the keyboard, which you can control by hitting Fn-F10. In fact, you'll need to hit the Function key to do other things, too, like adjusting the screen brightness or changing the volume levels.

Hands down, the ATIV Book's Samsung-made trackpad is the best we've tested in recent memory. Everything works as it should: two-finger scrolls, pinch-to-zoom and, best of all, single-finger tracking. It's that last part that's most impressive to us, really — plenty of Ultrabooks can zoom in smoothly, offering you lots of control as you re-scale the page. But few do a good job with simple one-finger navigation, for some reason. Here, though, the cursor goes where you want it to, with no stopping or stuttering — a good thing when you're poking around the desktop in 1080p. What's more, the button itself is easy to press and it never (ever!) mistakes a left click for a right one. Why can't all Windows touchpads be like this?

DISPLAY AND SOUND

No, it's not the 3,200 x 1,800 laptop display Samsung just showed off at SID, but the 13.3-inch, 1080p panel here is still crisp, with no obvious pixelation or jagged edges. We were especially fond of the potent colors, which stay vibrant even as you dip the screen forward or watch from the side. At times, the glossy finish can

interfere with the viewing angles, but adjusting the brightness along its 350-nit range seems to mitigate that.

Would you rather your laptop's sound quality be shrill and tinny or quietly rich? That's the choice we've been forced to make with all sorts of Ultrabooks lately, first with the Toshiba Kirabook and ASUS Transformer Book, and now with the ATIV Book 7. If you're like us, you'll take the balanced sound, even if it means you can't rock out at quite the volume Justin Timberlake requires. And that's what the ATIV Book 7 has to offer, really. I enjoyed listening to everything from jazz to punk rock to top 40 pop, but the maximum volume setting usually wasn't enough — even traffic rumbling by an open window was enough to drown out the audio somewhat, which means creaky air conditioners are likely to be a problem too. The hitch, though, is that the sound gets more distorted the higher up the scale you go.

Samsung left room for a spacious keyboard and lots of ports.



All of which is to say, you should be fine if you're hanging out alone in a quiet space, but you might want to whip out a louder external speaker set once AC season gets underway.

PERFORMANCE AND BATTERY LIFE

The ATIV Book 7 has 4GB of RAM, a Samsung-made 128GB SSD, integrated Intel HD 4000 graphics and an Ivy

Bridge Core i5-3337U processor clocked at 1.8GHz. The solid-state drive notwithstanding, those are the same exact specs you'll find in various recent Ultrabooks, including the MSI Slidebook S20. It should be no surprise, then, that it delivers nearly identical benchmark scores in everything from PCMark 7 to graphics tests like 3DMark. Its eight-second startup time is typical too.

| BENCHMARK | PCMARK7 | 3DMARK06 | 3DMARK11 | ATTO (TOP DISK SPEEDS) |
|--|---------|----------|----------------------|-------------------------------------|
| SAMSUNG ATIV BOOK 7 (1.8GHZ CORE i5-3337U, INTEL HD 4000) | 4,418 | 4,045 | E1081 / P600 | 626 MB/S (READS); 137 MB/S (WRITES) |
| ASUS TRANSFORMER BOOK (1.9GHZ CORE i7-3517U, INTEL HD 4000) | 4,414 | 3,840 | E924 / P512 / X177 | 482 MB/S (READS); 317 MB/S (WRITES) |
| TOSHIBA KIRABOOK (2.0GHZ CORE i7-3537U, INTEL HD 4000) | 5,275 | 5,272 | N/A | 553 MB/S (READS); 500 MB/S (WRITES) |
| ACER ASPIRE S7 (1.9GHZ CORE i7-3517U, INTEL HD 4000) | 5,011 | 4,918 | E1035 / P620 / X208 | 934 MB/S (READS); 686 MB/S (WRITES) |
| MSI SLIDEBOOK S20 (1.8GHZ CORE i5-3337U, INTEL HD 4000) | 4,043 | 3,944 | E1,053 / P578 | 484 MB/S (READS); 286 MB/S (WRITES) |
| ASUS TAICHI 21 (1.9GHZ CORE i7-3517U, INTEL HD 4000) | 4,998 | 4,818 | E1,137 / P610 / X201 | 516 MB/S (READS); 431 MB/S (WRITES) |
| MICROSOFT SURFACE PRO (1.7GHZ CORE i5-3317U, INTEL HD 4000) | 4,673 | 3,811 | E1,019 / P552 | 526 MB/S (READS); 201 MB/S (WRITES) |
| LENOVO IDEAPAD YOGA 13 (1.7GHZ CORE i5-3317U, INTEL HD 4000) | 4,422 | 4,415 | E917 / P572 | 278 MB/S (READS); 263 MB/S (WRITES) |
| DELL XPS 12 (1.7GHZ CORE i5-3317U, INTEL HD 4000) | 4,673 | 4,520 | N/A | 516 MB/S (READS); 263 MB/S (WRITES) |



| WINDOWS 8 SYSTEMS | BATTERY LIFE |
|----------------------------------|------------------------------|
| SAMSUNG ATIV BOOK 7 | 5:02 |
| ACER ICONIA W700 | 7:13 |
| SAMSUNG SERIES 9 (13-INCH, 2012) | 7:02 |
| MACBOOK AIR (13-INCH, 2012) | 6:34 (OS X) / 4:28 (WINDOWS) |
| DELL XPS 14 | 6:18 |
| SONY VAIO T13 | 5:39 |
| LENOVO IDEAPAD YOGA 13 | 5:32 |
| DELL XPS 12 | 5:30 |
| SAMSUNG SERIES 5 ULTRATOUCH | 5:23 |
| ASUS ZENBOOK PRIME UX31A TOUCH | 5:15 |
| ASUS ZENBOOK PRIME UX51VZ | 5:15 |
| TOSHIBA SATELLITE U845W | 5:13 |
| TOSHIBA KIRABOOK | 5:12 |
| TOSHIBA SATELLITE U845 | 5:12 |
| ACER ASPIRE TIMELINE ULTRA M3 | 5:11 |
| TOSHIBA SATELLITE U925T | 5:10 |
| LENOVO THINKPAD X1 CARBON | 5:07 |
| ACER ASPIRE TIMELINE ULTRA M5 | 5:05 |
| ASUS TRANSFORMER BOOK | 5:01 (TABLET ONLY) |
| LENOVO THINKPAD X1 CARBON TOUCH | 5:00 |
| SONY VAIO DUO 11 | 4:47 |
| ACER ASPIRE S5 | 4:35 |

Really, the one thing that surprised us was disk performance. For starters, the SSD's write speeds are on the slow side, with an average of 137 MB/s in ATTO. At the same time, its read speeds were all over the place — but always higher than average. Even at the lowest, we observed transfer rates around 545 MB/s, which is still better than what you'll get from most Ultrabooks. When it was good, though, it was really good — as high as 742 MB/s, to be exact. After running the same test many times, we ended up with an average of 626 MB/s, which is still excellent indeed.

Anecdotally, apps launched quickly and we had no problem juggling Netflix with music streaming and some schizophrenic tab-jumping in IE10. After about an hour of playing music through the browser, the keyboard still felt cool, though the bottom side felt warm near the fan. It never got hot, however, so you shouldn't feel shy about putting this in your lap, as it was intended to be used. The fan noise is also minimal, especially compared to rivals like the Kirabook.

Samsung rates the ATIV Book's 57Wh battery for 6.7 hours. We suppose you could approach that kind of runtime in real life — *if* you're doing something low-intensive, like web surfing, and with the display brightness set to a low level. In our test, which involves looping a video off the local drive with WiFi on and the brightness fixed at 65 percent, the battery lasted five hours and two minutes. As we al-



ways say in these Ultrabook reviews, that's not *bad*, per se, at least relatively speaking; touchscreen laptops with Ivy Bridge don't last more than five and a half hours on a charge anyway. In this case, though, we were rather hoping that the ATIV Book 7 would justify its extra weight with out-of-this-world battery life. Fortunately, at least, Haswell should help in that department, assuming Samsung eventually orders a CPU refresh.

SOFTWARE AND WARRANTY

It's never a good sign when you need to take not one, but two screenshots to illustrate how much software comes pre-installed on a computer. Samsung definitely went to town here, throwing in a mix of its own programs as well as some third-party ones. On tap, we've got Netflix, Evernote Touch, Kindle, Merriam-Webster, S Camera, S Player, S Gallery, Samsung Signature Store, Samsung SW Update, the Intel AppUp store, Music Maker Jam, StumbleUpon, Bitcasa, Jamie Oliver's Recipes, rara.com, 7digital, Slacker, Pandora, ChatOn, Photo Editor, Skitch, Fresh Paint, *The Treasures of Montezuma*, WeatherBug, AccuWeather.com, Samsung's Music Hub, Box.com, Nook and TuneIn. Samsung also included a few Xbox Live games (*Pinball FX*, *Adera*, *Shark Dash*, *Microsoft Mahjong*, *Microsoft Solitaire Collection*, *Wordament*, *Cut the Rope* and *Minesweeper*), along with a tile for *Plants vs. Zombies* that's actually just

a link to buy it.

It's a ridiculously long list that's full of redundancies (how many weather and music-streaming apps does one need?). Worse, there's even more: we haven't even gotten to the desktop apps. In addition to everything we've mentioned so far, Samsung also bundled a trial of Norton Internet Security and its own Kies file-transfer software. Wrapping up, you'll find Samsung's first-party apps for phone-screen sharing.

The ATIV Book 7 comes with a one-year warranty, just like most of the other PCs you might be considering.

CONFIGURATION OPTIONS

The ATIV Book 7 is available in just one configuration in the US: the \$1,060 model we tested, with the Core i5 Ivy Bridge processor, 4GB of RAM and 128GB SSD. Samsung won't comment on whether it plans to upgrade the machine to Haswell or add additional configuration options, like a Core i7 CPU or 256GB solid-state drive. Fortunately, Samsung has a proven history of refreshing its high-end machines as well as introducing additional configurations later on, so all hope is not lost.

THE COMPETITION

It's difficult to compare the ATIV Book 7 to the rest of the market, when so many of its more obvious rivals (the Lenovo Yoga 13, Acer Aspire S7, Dell XPS 12) are due for refreshes themselves. In particular, with Intel about to formally



The ATIV Book 7 is a good deal, the lack of Haswell notwithstanding.

introduce its next-gen Haswell processors, we're likely to see some brand-new designs altogether. Unless you're desperate, then, we suggest holding off on buying anything until all of the major players have shown their cards.

Slowly but surely, though, we're starting to get a better idea of what the Ultrabook landscape will look like over the coming months. So far, we've seen the Toshiba Kirabook, which starts at a lofty \$1,600 with a Core i5 processor,

256GB of storage and a 2,560 x 1,440 display (non-touch, at least in the entry-level model). It's a crisp screen, to be sure, but the viewing angles are limited and, as we found with the Retina display MacBooks, not enough apps have been optimized to take advantage of that high resolution. Also, as lightweight as the machine is, its fan is one of the loudest we've encountered. Then, of course, there's the price, which is insane even when you factor in the two-year warranty and generous software package (full copies of Adobe Photoshop Elements / Premiere Elements and a two-year Norton subscription).

HP, meanwhile, just introduced the Envy TouchSmart 14 Ultrabook, which will go on

The ATIV Book 7 leans toward the high-end in styling.



sale later this summer with a 3,200 x 1,800 display option. Unfortunately, though, we don't know much about the other specs, and it's also unclear how much that screen upgrade will cost. Stay tuned, folks.

WRAP-UP

So far, it would seem that \$1,060 for a machine with a Core i5 processor, 1080p touchscreen and 128GB SSD is a pretty good deal, the lack of Haswell notwithstanding. And we're not just talking about the spec sheet, though that certainly makes for a good first impression. The ATIV Book 7 has *the best* touchpad we've used on a Windows laptop in a long, long time. That SSD offers faster read speeds than most competing Ultrabooks. The machine runs cool and quiet. The screen is sharper than the Yoga 13's, even though they're priced about the same, and it offers wide view-

ing angles, too. So far, so good, its last-gen CPU be damned.

Really, the biggest trade-offs are that it's heavier than other 13-inch Ultrabooks, while offering battery life that's similar, if not slightly shorter. The keyboard is fairly flat, but it's still serviceable. Lastly, there's also an egregious, almost insulting amount of bloatware here. Even so, none of these seem like dealbreakers, at least at this price. Naturally, we still suggest you wait for a Haswell upgrade, and also see what other PC makers come out with in the next few weeks. Tentatively, though, the ATIV Book 7 appears to be a solid choice — let's just hope Samsung eventually decides to add more configuration options. **D**

Dana Wollman is Reviews Editor at Engadget, a marathoner, lover of puns and a native Brooklynite.

BOTTOMLINE

SAMSUNG ATIV BOOK 7

\$1,060



PROS

- Beautiful 1080p display
- Fast transfer speeds, runs cool and quiet
- Great trackpad
- Good audio quality

CONS

- Heavy for a touchscreen Ultrabook
- Flat keyboard
- No Core i7 or 256GB SSD option
- Lots of bloatware

BOTTOMLINE

The ATIV Book 7 is a good value among touchscreen Ultrabooks, with a reliable trackpad, fast SSD and lovely display. The main trade-offs are a shallow keyboard and a relatively heavy frame.



HUAWEI ASCEND MATE



Does the 6.1-inch
Ascend Mate pack
enough punch to
best the supersized
competition?
By Jon Fingas

When Huawei revealed the Ascend Mate at CES this year, it felt like smartphones had reached an end point — they surely couldn't get any larger. We've since been proven wrong by Samsung's Galaxy Mega 6.3, but the 6.1-inch Ascend Mate has gone on sale first, and it's every bit as intimidating as it was in January. The question is whether or not Huawei has more than just size on its side. Is this nearly tablet-sized device worth putting in our pockets, and can it fend off the suddenly tiny-looking Galaxy Note II and Optimus G Pro? Read on, and you'll find out.



HARDWARE

Let's quickly deal with the elephant in the room: yes, the Ascend Mate is comfortable to hold. Despite that massive display, it won't strain the average hand during a phone call. Huawei has trimmed the bezels enough that a 6.1-inch LCD is actually viable. At 6.5 x 3.4 x 0.4 inches (163.5 x 85.7 x 9.9mm) and seven ounces (198g), the phone isn't as big or heavy as you'd expect for something that lords an extra 0.6 inch of screen over its rivals. The power button and volume rocker on the right side are within easy reach, too. Think of the Ascend Mate as the efficiently designed Sony Xperia ZL, writ large.

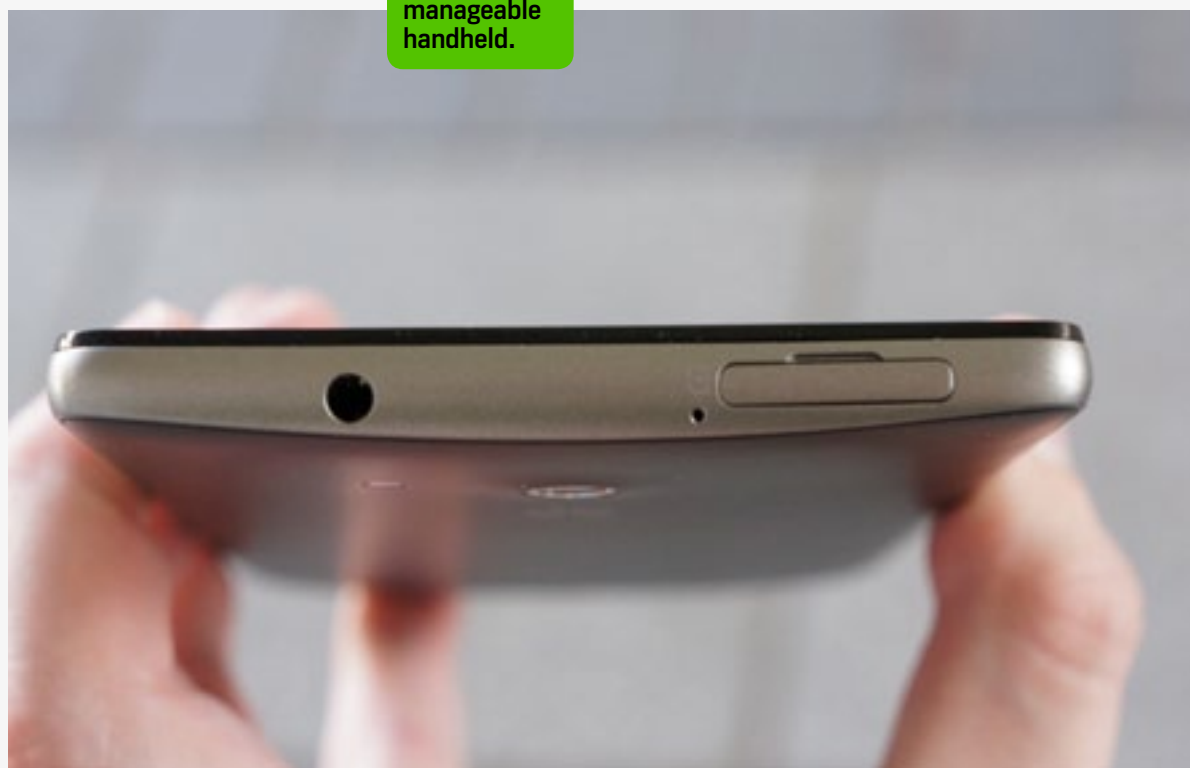
That said, there's no question that this behemoth pushes the limits of ergonomics, and not just in the hand. While it almost goes without saying that you need two hands to reach every corner of the screen, the phone isn't very pocketable, either. It fits into an average-sized jeans pocket comfortably, but with a conspicuous bulge; we wouldn't want to try the same feat with skinnier legwear. Who'd have thought that 5-inch phones like the Galaxy S 4 would suddenly seem compact?

No one will accuse Huawei of being

It's best to go shopping for a microSD card almost immediately.

a slave to fashion. The Ascend Mate's body is the definition of utilitarian: outside of the speaker and 8-megapixel rear camera, the back and sides are dominated by matte plastic. While this makes the LG and Samsung alternatives seem like works of art, it delivers the sturdy grip that's virtually necessary for a phone this big. The soft-touch finish on our black model (there's also a white version) is pleasing enough in our palms. At the front, there's just as much austerity. You'll find a 1-megapixel front camera as well as the requisite sensors and speaker, but it's largely a sea of scratch-resistant Gorilla Glass. All navigation

At 6.1 inches, the Ascend Mate is still a manageable handheld.



takes place on-screen.

Expansion and connectivity aren't quite as broad as we'd like. You'll find the micro-SIM slot and headphone jack at the top, a micro-USB port at the bottom and a microSDHC slot at the top-left corner. What you won't find is NFC, the Ascend D1 Quad XL's MHL video support or a lot of built-in storage. Huawei ships the Ascend Mate with just 8GB of flash memory built in, and only 4.68GB of that is accessible. We almost ran out of internal space within a few days of testing, and that was with just two (admittedly large) games, a handful of common social apps, 125 photos and three short 1080p video recordings. Unless your entertainment only involves streaming media and bite-sized games, it's best to go shopping for a microSD card almost immediately. And before you ask: no, there's no pen in the box, nor is there a pen-aware digitizer on the touchscreen. If handwritten notes are crucial to your workflow, you'll have to either make do with a third-party capacitive pen or shop for a Galaxy Note.

The battery isn't removable, although we suspect that owners won't mind as much as they would with other phones. The Ascend Mate carries a gargantuan 4,050mAh lithium pack that makes even the Droid RAZR Maxx HD's 3,300mAh unit seem modest. We'll talk about the raw numbers later on, but it's safe to say that we didn't spend much time hunting for wall outlets. There's

no wireless charging to let us skip the cabling entirely, though.

DISPLAY

This is why we're here, really. It's hard to convey exactly what a 6.1-inch phone screen is like to use: the Ascend Mate sits in a nether region between 2012's biggest smartphones and the smallest tablets. Software dictates that you control it like a phone, but the size encourages more tablet-like behavior patterns. Catching up with news on Flipboard? Marathon YouTube sessions? Both make far more sense here. We would gladly skip any smaller tablets if this phone were always at hand.

It's a good thing, then, that this is a high-quality display, though not as good as we'd like it to be. The IPS+ LCD has vibrant, yet well-balanced colors, without a conspicuous cast. Huawei lets fussier owners adjust the color temperature through a simple slider. Viewing angles are very wide, as you'd expect with IPS, although the picture dims slightly any time you're looking at the phone from off-center. Outdoor visibility is strong when the brightness is cranked up, and those of us in wintry climates will be happy to see a glove-

This is a high-quality display, though not as good as we'd like it to be.





The Ascend Mate doesn't make the jump to 1080p.

friendly, high-sensitivity touch mode.

However, there's no escaping that the Ascend Mate touts a 720p, 241-ppi screen at a moment when numerous smaller phones have made the leap to 1080p and over 440 ppi. You'll notice the individual pixels if you go looking for them, and you'll miss the print-like quality of phones like the Galaxy S 4, the One or Huawei's own Ascend D2 in those same moments. The Ascend Mate is mostly saved by the viewing distances that go along with such a big screen. Many won't hold the device all that close to their faces, and we stopped focusing on the pixels after a short while. Still, it would be nice if high resolution

and large size weren't mutually exclusive in the Ascend lineup.

SOFTWARE

For the most part, Huawei's Emotion UI layer circa Ice Cream Sandwich was an exercise in minimalism. Elements like the custom lock screen, 3D Home and themes were enough to remind us that we hadn't picked up a Nexus by mistake, but the company mostly stayed faithful to Google's Holo interface concept, for better or worse.

The Ascend Mate tosses much of that aside. While the phone makes a welcome upgrade to Jelly Bean (Android 4.1.2, to be exact) and brings both rich notifications as well as Google Now



to the forefront, the matching Emotion UI 1.5 refresh is a drastic makeover closer to what we've seen from other Chinese vendors. Its overhaul begins with a new look: Huawei makes its own visual theme the default, and there's no going back. At least there's more sophisticated theming this time around. You can pick from any of 20 (!) included themes, mixing and matching their fonts, icon sets, lock screens and sounds to your heart's content.

The big cognitive break comes when you go looking for the app drawer: there is none. Similar to what we've seen from Meizu and Xiaomi, whatever's on your home screens represents every app you have, and removing the icons uninstalls the apps themselves. The iOS-like concept is easier to understand — but it also means losing valuable screen real estate to apps that you may only use once in a blue moon. Huawei does go to some lengths to mitigate the effects by making space for 25 icons on each screen, allowing up to nine home screens and implementing an easy-to-use folder system. Nonetheless, it will

The big cognitive break comes when you go looking for the app drawer: there is none.

Huawei's Emotion UI 1.5 is layered on top of Jelly Bean.



require some housekeeping to prevent things from getting out of control.

Changes don't stop there, of course, and they're mostly positive despite that initial shock. After moving past the familiar shortcut-laden lock screen, you'll usually see the Me Widget. Picture it as a bento box for information: you can mix and match a group of Huawei-chosen widgets for clocks, contacts, music, photos and weather, all of which fit into a prescribed area. We made good use of it, although it's possible to remove the widget if it's consuming too much space. The notification bar has caught up to rivals with customizable



settings shortcuts, and the multitasking view has a helpful “sweep” button that immediately quits every app. Other additions? There’s an iOS-style Smart Reading component that lets users quickly search for words in Google, Wikipedia or a translator, while those tired of reconfiguring their phones for home and work have quick access to device profiles.

A few of the Emotion UI updates are designed with the Ascend Mate in mind. You can opt for a smaller, one-handed dial pad or keyboard, for example. The mode is helpful with such a wide device, although the toggle is buried in the OS settings rather than the keyboard itself. Those determined to make the most of the screen can hide the navigation bar on demand.

There are a few additions that fall flat. Easy Panel is a rough parallel to the mini apps we’ve seen from LG, Samsung, Sony and others, but it’s rudimentary. The floating apps are limited to just a calculator and a notepad, with shortcuts to the regular Gallery and Messaging apps rounding things out. Curiously, we also can’t launch Google Now from the navigation bar without first launching an app.

Guiding Wizard, an augmented reality navigation overlay, appears to be entirely missing on our Ascend Mate; we’ve reached out to find out what happened. While the new Emotion UI has more hits than misses, it’s apparent that Huawei is still learning the ropes of Android customization where its competitors are seasoned pros.

CAMERA

Have you used the D1 Quad XL’s cameras before? If so, you generally know what to expect with the Ascend Mate. The software hasn’t changed much at all. Photographers can either stick to the default Smart mode or choose from several presets. Choose Normal mode and the software unlocks full controls for settings such as exposure, saturation and white balance. Huawei doesn’t go over-

Photo quality is good, but not as stellar as the top handsets.



Smart mode occasionally produces odd results.

board with camera features like HTC and Samsung, but it does have beauty, burst, group, HDR, low-light, panorama and smile modes. Most of these do their jobs as promised, albeit with conspicuous limits. The panorama mode produces a narrow 90-degree arc, and the HDR mode is better at bringing out objects in shadows than it is at restoring details in bright light.

The output itself is generally good, but not up to the level of the latest range-topping smartphones. The 8-megapixel, backside-illuminated rear camera produces sharp daylight photos with a pleasingly soft background for close-ups, and both shutter lag as well as focus are reasonably quick (though not blindingly so). However, the Smart mode occasionally produces odd results. It tends to under-expose shots at times, creating what can best be described as a “burnt” look with exaggerated dark areas and occasionally muted or washed-out colors. Simultaneously, the camera tends to blow out the sky and other bright details. Low-light photography is also a glaring problem, as the camera can’t soak up ambient light as well as the better mobile cameras we’ve seen. The front, 1-megapixel camera? It’s merely serviceable, and won’t challenge

what HTC or Samsung bring to the table for resolution or overall quality.

Video recording has seen a slight upgrade from what we found in the D1 Quad XL. You can shoot 1080p video at a more common 30 frames-per-second instead of the old 24.8, reducing eyestrain and preserving more detail in each frame. Image quality runs into barriers as with photos, although a healthy 24 Mbps bitrate reduces visual artifacts and leads to uncommonly pristine audio. Huawei still hasn’t introduced support for tap-to-focus or simultaneous stills and videos, though.

PERFORMANCE AND BATTERY LIFE

The several months between the last of the 2012 Ascend line and the 2013 batch haven’t led to a big leap in performance. The Ascend Mate is once again running one of Huawei’s own HiSilicon K3V2 SoCs, this time clocked at a slightly higher 1.5GHz. While it’s a quad-core processor, it’s still based on ARM’s older Cortex-A9 architecture, rather than the newer A15 or a custom, in-between design like Qualcomm’s

For a smartphone whose size is so conducive to gaming, the graphics are more than a little disappointing.



| HUAWEI ASCEND MATE | SPECS |
|--------------------|--|
| DIMENSIONS | 163.5 X 85.7 X 9.9MM (6.5 X 3.4 X 0.4 IN) |
| WEIGHT | 6.99 OZ. (198G) |
| SCREEN SIZE | 6.1 INCHES |
| SCREEN RESOLUTION | 1,280 X 720 (241 PPI) |
| SCREEN TYPE | IPS+ LCD |
| BATTERY | 4,050MAH |
| INTERNAL STORAGE | 8GB (4.68GB AVAILABLE) |
| EXTERNAL STORAGE | MICROSDHC, UP TO 32GB |
| REAR CAMERA | 8.0MP, BSI, AF, LED FLASH |
| FRONT-FACING CAM | 1.0MP |
| VIDEO CAPTURE | 1080P REAR (720P FRONT) |
| NFC | NO |
| RADIOS | HSPA+ / UMTS: 850 / 900 / 1,700 / 1,900 / 2,100 GSM / GPRS: 850 / 900 / 1,800 / 1,900 |
| BLUETOOTH | V4.0+BLE |
| SOC | 1.5GHZ QUAD-CORE HUAWEI HISILICON K3V2; 40NM, 16-CORE GPU, 64-BIT MEMORY |
| RAM | 2GB |
| ENTERTAINMENT | DLNA, DOLBY DIGITAL PLUS AUDIO |
| WIFI | DUAL-BAND, 802.11A/B/G/N, WIFI DIRECT |
| WIRELESS CHARGING | NO |
| OPERATING SYSTEM | ANDROID 4.1.2, EMOTION UI |

Snapdragon range. Any improvement is more likely to come from Huawei doubling the RAM to 2GB; we had no problems juggling several apps at once.

Unfortunately for Huawei, the competition hasn't stayed put since the K3V2 reached shipping devices. Samsung was just bringing the firepower of the Galaxy Note II's Exynos 4 Quad to bear at the time we reviewed the D1 Quad XL, and the LG Optimus G Pro has the luxury of an even faster Snapdragon 600. While Huawei wasn't necessarily hoping to beat LG or Samsung in raw performance, the generational gap is still a bit too obvious for our liking: what was once a top-end processor is now closer to a budget model.

The limitations are most visible in graphics rendering. That GLBenchmark result gives a clue as to what's in store, but firing up a few games makes it clearer. Although an older game like *Riptide GP* runs smoothly, an intensive title like *Real Racing 3* stutters its way down to single-digit frame rates. For a smartphone whose size is so conducive to mobile gaming, that's more than a little disappointing. Ideally, Huawei would be shipping the K3V3 with the inaugural Ascend Mate, not its sequel.

You might forgive that sluggish performance after seeing the battery life, however. Huawei makes exceptional use of that 4,050mAh battery pack, and you don't have to be miserly to see the full benefits. With the Ascend Mate in a normal power profile, we could loop



| BENCHMARK | HUAWEI ASCEND MATE | LG OPTIMUS G PRO | SAMSUNG GALAXY NOTE II |
|---|--------------------------|---------------------|---------------------------|
| QUADRANT 2 | 5,619 | 12,435 | 6,819 |
| VELLAMO 2 HTML5 | 1,663 | 2,254 | 1,814 |
| ANTUTU 3 | 15,729 | 19,300 | 17,874 |
| SUNSPIDER 0.9.1 (MS) | 1,521 | 904 | 1,075 |
| GLBENCHMARK EGYPT 2.5 HD OFFSCREEN (FPS) | 7 | 27 | 17 |
| CF-BENCH | 13,424 | 20,019 | 15,244 |

SUNSPIDER: LOWER SCORES ARE BETTER

a 720p video in stress test conditions (screen at half brightness; WiFi on, but not connected; social apps in the background) for a whopping 12 hours and 40 minutes — one of the best results we've ever seen. If you're keeping score, that's two hours more than the Galaxy Note II and over five hours longer than the Optimus G Pro. The jury's out on the Galaxy Mega 6.3, although its 3,200mAh cell doesn't promise an evenly matched fight.

Real-world testing is more impressive still. The Ascend Mate easily lasts through a full day of moderate usage with battery to spare, and four hours of extreme camera testing left the phone with just over half of its capacity. If there's a setback, it's the time spent powering back up. While there won't be

Cellular performance won't impress anyone.

much trouble returning to full capacity when using the proprietary fast-charging adapter that Huawei supplies in the box, a computer's USB port or a regular phone adapter can take north of four hours to do the same job. That said, we'd much rather have the luxury of charging a device slowly at home than be forced into a quick mid-day recharge at work.

Cellular performance won't impress anyone, but we weren't expecting more when there's no trace of LTE inside the device. We received an unlocked, carrier-neutral Ascend Mate capable of 21 Mbps HSPA+ data on the 850 / 900 / 1700 / 1900 / 2100 bands, and managed a low, but usable average of 4.2 Mbps downstream and 2.1 Mbps upstream on Telus' network in Ottawa, Canada. Call quality on that network was merely adequate, both inbound and outbound; it wasn't exceedingly clear, but there were no outstanding complaints, even with background noise.



Media performance is solid, if hurt by that missing MHL. No one will wax poetic over the built-in speakerphone, which isn't particularly loud, but they could be happy with the Dolby Digital Plus audio. Similar to Beats processing, its equalization software fills out the sound range on headphones. The default audio profile is a bit bass-heavy, but it's possible to choose a different sound or shut off the Dolby software entirely if it's overwhelming. External video is limited to DLNA media sharing when there's no MHL to lean on.

WRAP-UP

At times, the Ascend Mate comes across as a two-sided smartphone. There's the would-be flagship, with a big screen and even bigger battery life. If you value those two factors above others, you may have found an ideal mobile companion: the Mate outperforms the Galaxy Note II and Optimus G Pro on both those fronts, and it may outlast the Galaxy Mega 6.3 on battery tests, too. The Ascend Mate breaks away from the pack on software. While we frequently prefer the stock Android interface,

Price and screen size don't make up for budget internals.



Huawei has shaped its Emotion UI into a truly unique and, at times, superior experience, as long as you don't mind that missing app drawer.

The other half is classic Huawei: that is, it's a budget-conscious device that undercuts its pricier competition. For all of the Ascend Mate's outward trappings of greatness, it's really a frugal phone on the inside with an older processor, 3G-only data, modest storage and mostly recycled camera technology. That's more than acceptable for those who mainly care about battery life and screen size, but these design sacrifices prevent the Mate from being the best in its class. We also want to see how the Galaxy Mega 6.3 stacks up in comparison. After all, Samsung's incoming gigantophone has LTE, a 16GB storage option and a more mature (if sometimes criticized) software bundle.

As such, the Ascend Mate makes the most sense if you can get one for a significantly lower price than its competitors. The good news is that you can, depending on where you live. As of this writing, a store like Expansys UK sells the Ascend Mate for £335 (\$508), a full £110 less than the £445 (\$674) Galaxy Note II. In Huawei's native China, it's an even cheaper ¥2,688 (\$438). Americans won't save as much over a Galaxy Note II (it's just a \$55 difference at Expansys), but the phone is still one of the least expensive in its category — especially if you're measuring the cost per screen inch. We've come to enjoy using the Ascend Mate, but we also accept that it's a specialized tool, not a jack of all trades. **D**

Jon is an Associate Editor, serial phone upgrader, photography junkie and unrepentantly Canadian.

BOTTOMLINE

**HUAWEI
ASCEND MATE****\$495
(UNLOCKED)****PROS**

- Giant, attractive screen
- Ample battery life
- Low price

CONS

- Slow
- Middling camera
- Low storage

BOTTOMLINE

The Ascend Mate tops them all for screen size and battery life, but it's a budget phone on the inside.



Peter Diamandis, CEO of the X PRIZE foundation, addresses his fellow Visioneers.

VISIONEERING

PELICAN HILL 2013

THE MINDS BEHIND XPRIZE



The making of the next visionary challenge

By Tim Stevens

There have been many critical moments in the history of space exploration — Sputnik in 1957, Yuri Gagarin in 1961, Neil Armstrong in 1969 — but if you look back over the history of manned happenings outside of the atmosphere, almost all of these moments were driven by government funds. You have to fast-forward all the way to October 4th, 2004, the moment that pilot Brian Binnie crested at an altitude of 112km in SpaceShipOne, to find a similarly important moment in the history of private space flight.

That moment wouldn't have come

when it did, and may never have come at all, if there hadn't been some incentive. In 2004, XPRIZE (formerly the X Prize Foundation) paid \$10 million to the Scaled Composites team headed up by Burt Rutan and Paul Allen for being first to make two trips to the edge of space in the span of two weeks. That single prize (which didn't come close to covering the team's expenses) ushered in a new era of private space travel and, for XPRIZE founder Peter Diamandis, demonstrated the power of competition.

XPRIZE didn't stop there, and each year it asks for help from some of the world's greatest thinkers, tasking them to decide which of the world's many and myriad problems are ready for solutions. Join us as we take you on the inside.



INTRODUCTIONS

I confess to being somewhat nervous walking into the pre-Visioneering mixer that was hosted on the lawn of the overwhelmingly posh Pelican Hill Resort, south of Los Angeles. When I'd been invited to join the weekend's festivities, I was excited. I'd watched every step of the Ansari XPRIZE development and had tuned in to catch all of the SpaceShipOne test flights live. When I learned that I wouldn't just be covering the event as a journalist but would actually be taking part in the Visioneering proceedings, the pressure ramped up.

I'd gone down the list of attendees in the days leading up to the conference,

Vint Cerf, VP and chief internet evangelist for Google and internet pioneer.

seeing names like Paul Allen and Quincy Jones and James Cameron, and so it was apparent this was going to be a very important weekend full of important people. Indeed I hadn't been at the opening event for five minutes before I was introduced to Naveen Jain, an incredibly successful self-made entrepreneur, who then kindly introduced me to Sprint CEO Dan Hesse, who truly is as genuinely nice and straightforward as those black and white commercials from a few years ago made him out to be.

It was a dizzying evening of shaking hands with powerful people, but I'm happy to say I had an instant icebreaker: Google Glass. Everyone wanted to ask how it worked; everyone wanted to try it on. And so, thankfully, it was easy



to strike up a conversation with anyone. Okay, Glass, thank you for that.

One person I didn't get to speak with that night? Peter Diamandis, XPRIZE's founder and the man without whom none of us would be there. He was, predictably, a little busy that night, but thankfully I would catch up with him before the weekend was through.

THE ORIGIN

As a child, Diamandis obsessed over the idea of getting into space, a drive that helped him win the Estes Rocket Design Competition at age 12. Through the course of his higher education, Diamandis founded organizations at both MIT (Students for the Exploration and Development of Space) and Harvard Medical School (Space Generation Foundation) with the intent of furthering exploration and development beyond the Earth's gravitational influences.

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CALCULATIONS
AND
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WERE ONE
IN 1,000.”**

It's thanks to that motivation and curiosity about what's going on *out there* that the XPRIZE exists — that, plus a realistic appreciation for numbers. Diamandis recalls: “XPRIZE came out of a personal passion that I wanted to go into space. I did the calculations and statistically my chances of becoming a NASA astronaut were one in 1,000.”

Rather than let fate — and the whims of an aging space program — dictate whether he would follow his dream out of the atmosphere, Diamandis decided instead to give the commercial space industry a big kick in the pants. He was inspired by the 1919 Orteig Prize, in which hotel magnate Raymond Orteig offered \$25,000 to the first team to fly non-stop from New York to Paris (or vice versa). The winner, Charles Lindbergh, went on to international fame and glory. More importantly, the trans-continental flight industry was born and, over the following three years alone, the number of US airline travelers would increase by nearly 3,000 percent.

Diamandis proposed a similar competition for sub-orbital flight in 1996. With funding from venture capitalists Anousheh and Amir Ansari, plus numerous other donors (including author Tom Clancy and the New Spirit of St. Louis Organization), the \$10 million Ansari XPRIZE for Suborbital Spaceflight was launched.

And it was successful. In 2004, Tier One, a team backed by Allen and built on the technology of Rutan's Scaled Composites, completed the requirement



of two flights to an altitude greater than 100km by the same vehicle within two weeks. The modern era of commercial space travel had truly begun.

COMPETITIONS

Though the Ansari prize would be the first and remains far and away the most famous XPRIZE, it would be far from the last. There was the Progressive Insurance Automotive XPRIZE, won in 2010 by the Edison2 VLC (which just showed off an EV version) after it managed 102MPG. And of course there's the ongoing Google Lunar XPRIZE, a \$30 million collection of prizes for teams aiming to land a robot on the moon.

These competitions are compelling not only for their often dramatic final flourishes, but for the broader impact they make on the world at large. "We're not interested in creating an historic

"WE'RE NOT INTERESTED IN CREATING AN HISTORIC MOMENT. WE'RE INTERESTED IN CREATING A NEW INDUSTRY."

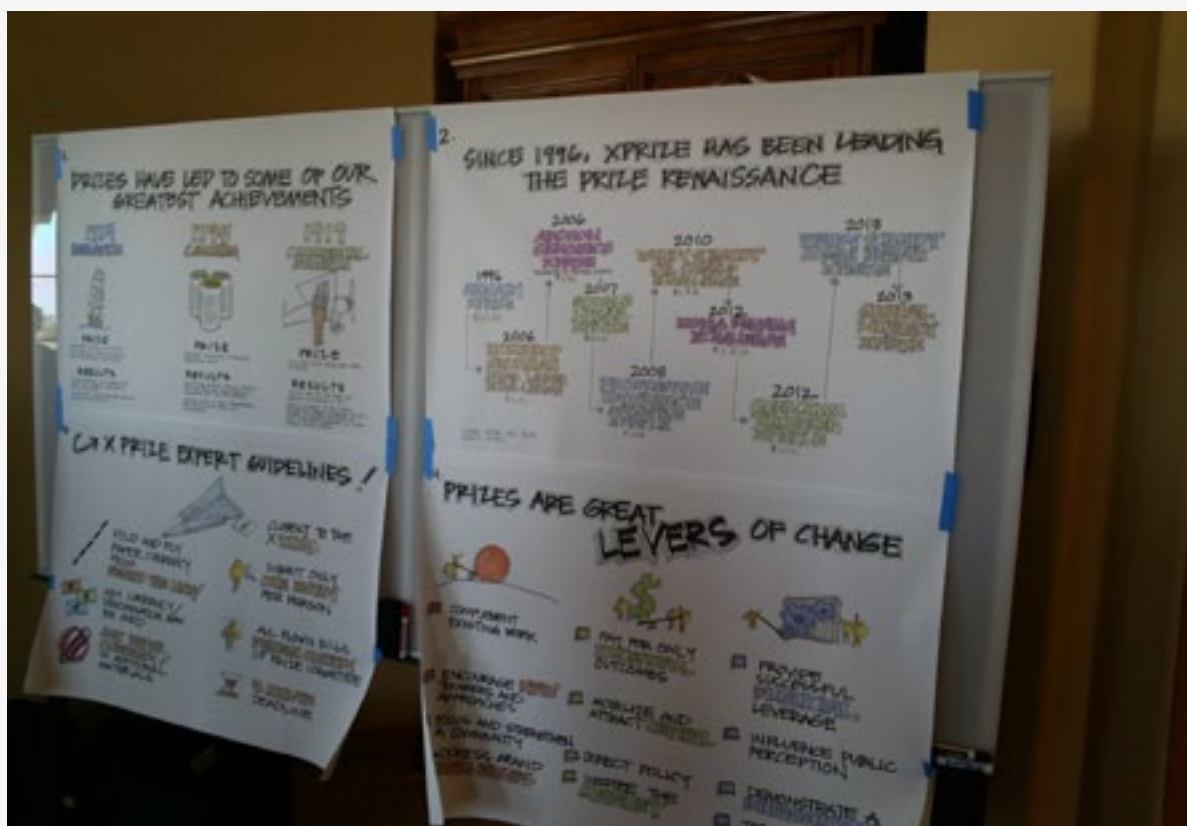
moment," Diamandis told us. "We're interested in creating a new industry." Indeed, with much of the foundation's funding coming from entrepreneurs like Larry Page and Elon Musk, it's hard to ignore the commercial implications of many of these competitions.

Sir Richard Branson stepped in to turn the winning Ansari XPRIZE team into Virgin Galactic. One can imagine that any of the lunar-mining startups

would eagerly gobble up the winner of the Google Lunar XPRIZE. But, while the allure of fame and fortune must always be a part of these competitions, there's a strong humanitarian aspect of XPRIZE's work.

The Wendy Schmidt Oil Cleanup competition, for example, tasked en-

Historical prize-based achievements along with XPRIZE's background and track record to date posted for Visioneering attendees.



trants with greatly increasing the speed and efficiency of current oil cleanup solutions. The winners, Team Elastec / American Marine, developed a solution that was three times faster than anything the industry had previously created. They won \$1 million for their troubles. More recently, the fancifully named Qualcomm Tricorder XPRIZE aims to make Bones' favorite tool a reality. Diamandis describes it thusly: "A medical device that any mom could use at 2 AM to diagnose her kid without the need for a physician or a nurse."

It's a tall order, but not an insurmountable one. Nearly 300 teams have pre-registered so far, hoping to take home the \$10 million prize and, along the way, completely reboot the field of diagnostic medicine in much the same way that J.J. Abrams is rebooting the competition's inspiring franchise.

The combination of a compelling challenge mixed with a financial reward and a shot at global recognition is a potent one. "Our goal is to help innovators innovate," said Diamandis. "To give them attention. To give them capital. To give them excuses to go and do stuff." However, with continued success comes a growing risk: run too many com-

petitions and the "attention" portion of the equation begins to decline.

The signal-to-noise ratio is crucial. In order for XPRIZE to continue generating maximum excitement and publicity, those competitions must be few and they must be far-reaching. With a world full of problems in need of attention, the decision of which to throw the foundation's collective might behind is of vital importance.

VISIONEERING

It's the Visioneering gathering I attended that sets the tone for the coming year. Said Diamandis: "Once a year we get together in some location ... We bring together people from around the world, top benefactors, CEOs, heads of industry, heads of government ... and

Dan Hesse, CEO of Sprint and a genuinely nice guy IRL.



WHEN IN THE COMPANY OF PAUL ALLEN, EVEN THE GREATEST ENTREPRENEURIAL AND CHARITABLE ACHIEVEMENTS AREN'T WORTH BRAGGING ABOUT.

we debate and discuss what the problems should be that we could solve.”

This year, over 100 such minds were brought together, an amazing collection of luminaries like Microsoft co-founder Allen, Sprint CEO Hesse, Qualcomm CEO Paul Jacobs and Google VP (and father of the internet) Vint Cerf. Also, me.

This was, quite simply, an awe-inspiring group of people to be surrounded by. Also impressive? How well everyone got along. This is, by and large, a collection of strong-willed individuals who are quite used to getting their way. I've seen companies struggle to maintain momentum with just two CEOs at the helm — however can you get anything done when soliciting the opinions of dozens?

First of all, you have everyone check their egos at the door. That's not a stated requirement of XPRIZE participation, but rather a necessary product of the compiled group. When you're in the company of someone like Paul Allen, even the greatest entrepreneurial and charitable achievements aren't worth bragging about. Everyone, then, seemed remarkably at ease — even Mr. Allen himself.

Secondly, you narrow the focus. Each year XPRIZE creates some specific (though still broad) categories to herd

this highly curated selection of cats into a number of predefined buckets. For 2013, these were the available discussion points:

- AGING
- BEHAVIOR
- HAPPINESS
- INFRASTRUCTURE
- LEARNING
- MOBILITY
- SECURITY
- WOMEN & GIRLS

Finally, you create a structure that encourages teamwork and yet taps into the incredible drive exhibited by so many of the participants. That's no easy task.

THE PROCESS

There are those who can, in 90 seconds or less, win over your heart, your mind and, most importantly, your wallet to whatever cause is being hastily delivered. At Visioneering, the elevator pitch becomes the culmination of a week-end's worth of brainstorming.

What's being pitched? Nothing less than solutions to the world's problems. The overall Visioneering group splits up into the various topics listed above,





Legendary music producer Quincy Jones leading a discussion during the Visioneering proceedings.

with each person able to participate in two. Within each topic, ever-smaller groups are formed to tackle more discrete problems.

These problems are sliced into their barest elements before being put back together again into a framework for

**THE ELEVATOR
PITCH HAS
BEEN PERFECTED
BY SOME TO
THE LEVEL OF
FINE ART.**

CHUCK ZLOTNICK

what could, some day, be an actual XPRIZE competition. For example, in the mobility topic, the inefficiency of air travel was identified as one problem area. That was whittled down to airport security and then to scanners at airports. The result? A proposal for a competition to create a system that would double the speed of current airport security checkpoints while also doubling the detection rate of weapons and other banned items and substances. It's no Orteig prize, but it is something we can almost all relate to.

Other proposed competitions included conceptual vehicles that would revolutionize public transport and a Tony Stark-style exoskeleton for seniors. Quite a diverse selection of pro-



posals, the vast majority destined to be discarded through multiple rounds of voting. This is where the elevator pitch comes in.

One or more representatives from each team are selected to give a 90-second speech detailing why their idea is the best and, after all teams present, the entire group votes for their favorites. Winners move on to the next round, then the next, until just five proposals are left for the final showdown: a high-pressure pitch-off in front of the gathered crowd at the final dinner.

THE MOOD RING

I, too, got involved in the pitching. For some reason that I can't quite remember, I'd chosen to join the Happiness group. Perhaps when I was selecting my sessions, I was in a particularly good mood and wanted to find a way to share that with the rest of the world. Or, perhaps it's quite the contrary and I was looking for a little help myself. Either way, during that session we were tasked with the daunting prospect of formulating a theoretical XPRIZE competition that could raise humanity's overall happiness.

After hours of discussion and debate within a group of individuals who all quite naturally had

THE MOOD RING COULD SAY THAT YOU'RE MUCH HAPPIER ON DAYS THAT YOU START BY GOING TO THE GYM.

their own concepts of what makes people happy, we finally started to home in on a single idea: you can't manage what you can't measure. If you can't measure happiness, how can you hope to improve it? Thus, the Mood Ring was born.

This theoretical device (which may or may not be an actual ring) would, through a series of biometric sensors, begin to study and track your stress and endorphin levels, effectively develop-

NASA Deputy Administrator Lori Garver on stage for a presentation.





Engadget's own Tim Stevens [second from left] during his team's Mood Ring pitch for the XPRIZE.

ing a personal happiness index. That statistical information would then be augmented by user-provided data, like “Went to the gym at 9 AM” or “Had a big bowl of ice cream after dinner.”

That information, combined with your personal happiness index, would allow the device to make behavioral recommendations to improve happiness — a little like how the Jawbone Up tries to help improve your sleep patterns. It could, for example, say that you’re much happier on days that you start by going to the gym, or that downing a venti mocha in the morning gives you a short-term mental perk, but will soon leave you lagging.

The team I was a part of believed that this could both help individuals

figure out their own mental well-being while also building a global database of information tying behavior to happiness. Beyond that, it would extend the personal fitness device realm (dominated by the Jawbones and the Fitbits of the world) into a powerful new market of mental health.

We thought it was a great idea for a future XPRIZE competition and I, along with Aaron Harrington of Explore Media 360 (the folks who do many of the 360-degree interior business shots for Google Maps), were designated to represent it on-stage. After getting a little pitch coaching from an expert, we refined and honed our presentation, balancing the art of establishing a personal connection with each person in the audience while informing them of the device’s global potential. We had less than



30 minutes to refine our pitch, but we ran through it enough times that when it came time to deliver on-stage, our presentation took exactly 90 seconds.

Mood Ring was good enough to make it through two rounds of eliminations and into the semi-finals, but ultimately we didn't have enough to make it in to the final round. Given the groundbreaking potential of those five that did, I didn't mind losing out one bit.

THE FINALISTS

Here were the five XPRIZE concepts that were pitched in front of the entire Visioneering group at a gala event on the final evening.



Motivational speaker Tony Robbins speaks to Visioneering participants via telepresence robot.

METEOR OF THE MIND — This proposal spoke to the daunting prospect that lies ahead of us thanks to the increasing prevalence of dementia. In a presentation backed by a slick computer-animated short depicting a massive meteor making its way toward Earth (that the team somehow whipped up in a matter of hours), this competition would reward those who can improve the early detection and treatment of Alzheimer's disease.

NETWORK — Pitched by the enthusiastic and well-spoken Kosta Grammatis (who had a hand in the Eyeborg Project and who designed a satellite for SpaceX), this contest would work toward furthering internet access to the developing nations. Grammatis spoke passionately about the power of the knowledge that the internet contains and how easy access to it could help to improve the human condition worldwide.

RAINMAKER — A growing world population needs water and attempts at building and enhancing water desalination and purification plants are not keeping pace. This contest, pitched by Eric Hirshberg, the CEO of Activision Publishing, would encourage teams to create systems that could pull vapor from the air, creating a new source for clean drinking water.

GAME CHANGER — The gamification of education has had some notable highs over the years (the *Carmen Sandiego* series, *Oregon Trail*), but most attempts at making learning fun have failed. This would be a new one, a contest to encourage game creators and educators to work together and create a new, engaging elementary education system.

X^2 THE MOTHER OF ALL PRIZES — This contest proposal was rather different than the rest. Rather than tackling a specific global ill, this contest would change the demographics of XPRIZE competitions and, ultimately, the industries they foster. This would be a bonus applied to any winning XPRIZE team comprised of at least 50 percent women.



THE IDEA WAS TO CRACK, SHAKE AND HOLD ALOFT THE COLOR DESIGNATED FOR YOUR FAVORITE PROJECT, A PROCEDURE THAT PREDICTABLY DEVOLVED INTO SOMETHING RESEMBLING A SORT OF POSH RAVE — MINUS THE NITROUS OXIDE AND THE BABY NOOKS.

All great concepts, all delivered skillfully in front of an eager audience. At the end, voting was conducted in an unusual way: glow sticks. The idea was to crack, shake and hold aloft the color designated for your favorite project, a procedure that predictably devolved into something resembling a sort of posh rave — minus the nitrous oxide and the baby nooks.

The winner? Well, there were two, as it turned out. The X² prize was an overwhelming favorite thanks to its powerful, yet simple concept — and thanks to another important attribute: it was fully funded. Lynn Tilton, CEO of Patriarch Partners and a noted philanthropist, not only pitched the idea but also pledged to fund it herself. As many would tell me through the weekend, already-funded projects get a definite boost in popularity when it comes time to vote.

The other winner was Meteor of the Mind, an incredibly worthy cause that nearly everyone in the audience

could relate to in some way or another. Both teams got a 3D-printed trophy (courtesy of 3D Systems) and the knowledge that their combination of great ideas and onstage presence trumped the rest.

FROM IDEATION TO EXECUTION

Though there's no guarantee that any of the chosen finalists, or indeed the winners, will be turned into future XPRIZE competitions, there is certainly plenty of precedent. The Wendy Schmidt Oil Cleanup XCHALLENGE was born of a Visioneering discussion, and so too the Qualcomm Tricorder XPRIZE — after receiving a tidy branding makeover from its proposed name of “AI Physician.”

Both of this year's winners seem like naturals for inclusion as future competitions and both, we think, could be very successful despite being somewhat atypical of previous XPRIZE successes. Neither would spur the cre-





Visioneering 2013 winning teams [top, left to right]: Jonathan Knowles, Elizabeth Fleming, Freda Lewis-Hall, Cheryl McEwen, Eric Leuthardt, Lynn Tilton, Kosta Grammatidis, Dean Ornish and Robert K. Weiss. [Bottom, left to right]: Michael Boustridge, Eric Esrailian, Peter Diamandis, Ken Dychtwald and Scott Turner.

ation of a new industry, and indeed neither will result in the sort of iconic victory moment we saw when Binnie climbed on top of SpaceShipOne

and unfurled an American flag. Nevertheless, both have the potential to bring something very important to the world: hope. **D**

Tim Stevens is Editor-in-chief at Engadget, a lifelong gamer, a wanna-be racer, and a born Vermonter.



THE ENGADGET INTERVIEW

Thad Starner



**Wearable-
technology pioneer
Thad Starner on
how Google Glass
could augment
our realities and
memories**

By Tim Stevens

COUNTLESS WEARERS OF GOOGLE GLASS stalked the halls of this year's Google I/O developer conference, but only a lucky few were sporting the prescription model, which makes room for lenses in a more conventional glasses frame. Among those lucky early adopters with imperfect vision was Thad Starner, a Georgia Tech professor who, in 2010, was recruited to join a top-secret project at Google's fabled X Lab. That project, as it turned out, was



Glass, and Starner's role on the team as a technical lead would be a vital one.

Starner claims he *invented* the term “augmented reality” in 1990 and, after experimenting with wearable technologies for 20 years now, offered us a rare perspective on where the stuff has been and where it's headed. So, then, we were very glad to get a few moments to chat with the man at I/O and get his insight into how we got to be where we are and, indeed, get some suggestions from him on where we're going from here.

Starner says he's been wearing computer devices of some form or another daily for the past 20 years, a claim that few others can make. Before becoming an assistant professor at Georgia Tech, he founded MIT's Wearable Computing Project. It's in these years that he made the acquaintance of a pair of grad students named Larry Page and Sergey Brin. The group had discussions about the future of search and, given Starner's tech persuasions, how

MIT Media Laboratory's
Perceptual Computing Group
[from left]: Alex Pentland, Steve
Mann, Thad Starner and Rehmi
Post (circa 1996).

PAM BERRY/THE BOSTON GLOBE VIA GETTY IMAGES



wearables might fit in to that:

“We talked about how it would make you more powerful if you could have web search on your eyeball ... One of the problems was simply making a search engine that was good enough that the right hit was in the first four links, versus AltaVista which was the first 14 links. That took way too long to navigate.”

They went their separate ways, Starner continuing to refine his wearable prototypes while Page and Brin built themselves a little search engine. After about a decade, Starner thought that it was time to reconnect:

“About 2010, I sent Sergey an email saying, ‘Now that you guys are doing Android and you’re doing these phones, you should really take a look at the wearable computing technology that we’ve been working on in academia. Why don’t you come out to Atlanta and I’ll show this stuff to you?’ Next thing I know I’m on a plane out [to Google Headquarters] to join the Glass team. They had the same kind of thoughts. The time was right. The next thing you know I’m working on it too, making the early prototypes.”

The term “augmented reality” comes from Starner’s earlier work, a 1990 fellowship proposal. (Fun fact: this wasn’t actually Starner’s preferred term. “Artificial reality” had already been used by Timothy Leary to describe a drug-

induced state.) However, his concept of a life augmented by technology is rather different than the “AR” that we generally think of when describing things like the Layar browser.

Starner’s term for augmented reality simply referred to “information you can use while you’re doing other things.” He continued: “Your point on a map is in some senses augmented reality. Knowing what restaurants are nearby is augmented reality.” What we typically think of as “AR” is an extension of

The term “artificial reality” had already been used by one Timothy Leary to describe a drug-induced state.



augmented reality called registered graphics. In this way, a system is fully aware of your 3D position in space plus your orientation and is able to use that information to virtually paint information over the landscape.

This, for many users, is the perceived Holy Grail of wearable technologies: a fully immersive experience where virtual displays appear and disappear at will, where every friend you spot in the real world is highlighted by an icon floating over their heads and where you can always find your way by following the all-knowing green arrow hovering over you. For Starner, these applications aren't nearly as compelling as a system that quickly provides information when you need it and then disappears just as quickly:

"The big thing that people don't realize is that it's not about the full-field-of-view, registered AR experience. It's much better to have something you can interact with in micro-interactions. That's what Glass is all about, having these short interactions throughout the day. You're really trying to make interfaces that allow people to augment their eyes, ears and mind, but not get mired in the virtual world."

There's value in physicalities, he continued: "There's a lot to the tangible nature of devices and their interfaces that make a lot of sense. I'm loathe to give up on tangible interfaces ... Having an actual physical object that everyone is looking at and sharing is an important thing."

In this way, Glass is already in good shape on the AR front. That, though, is only one of three key aspects that are, for Starner, crucial to wearable devices. In a 1993 article called "The Cyborgs are Coming," he suggested two other crucial features.

The first is augmented memory, which is simply the ability to look up information previously learned, but possibly forgotten. For Starner, the primary focus has been conversation. "Having access to your education, having access to your everyday conversations on that level, so you can actually use it in face-to-face education, is invaluable," he said. "It makes professors seem smarter than they are — which is a very big



thing when you're a professor!"

He gave us a quick demonstration of a system called a Remembrance Agent, which he runs on all manner of wearable devices. It is, effectively, a massive text buffer of everything he's said or thought was worth typing down. Through this he can quickly and easily search within using a single-handed keyboard called a Twiddler. (Despite its one-handed nature, Starnier is quite proud of his ability to type at 130 words per minute.) Using a little regex search, Starnier can query through *decades* of textual memories. The results aren't great, but there's potential, he said:

"Everything I say goes into a text buffer and then it automatically searches my past history for things that are relevant. Most of the time it pulls up garbage, stuff that doesn't matter. But 5 percent of the time it pulls up something that's really relevant. All it takes is a one-line summary to remind me of what was so important. It's not that it's replacing my memory; it's helping me recall stuff. Computers are really good at recall and really bad at recognition. People are the other way around."

The final, and in some ways most complicated, aspect is the development of what Starnier calls "intellectual collectives." These are, effectively, social networks — but

not in the Facebook or (more appropriately) Google+ kind of way. These networks are much more focused on real-time information sharing and collaboration. In other words: they make people *more* productive, not less.

Starnier described the process of interviewing candidates on the Glass team at Google: face-to-face conversations between a single candidate and a single interviewer while other members of the team watched remotely, conversing with the interviewer actively while he or she in turn conversed with the interviewee. It all sounds horribly distracting; a side-channel that Starnier said is actually perfectly intuitive:

"You try to read your email while you're having a conversation, you lose 40 IQ points."



“Because it’s focused on the conversation you’re having, it’s not distracting. You try to read your email while you’re having a conversation, you lose 40 IQ points. When you actually are taking notes and doing stuff that’s related to your conversation you can do it just fine.”

In this way the entire team could participate in the interview at the same time without physically needing to be there, hitting the hapless interviewee with questions from multiple minds all delivered through a single mouth. An intimidating process for the recipient, perhaps, but it certainly beats the typical corporate interview procedure of bouncing between offices and getting asked the same questions over and over again.

Starner described another situation, talking about wearable technology at the National Academy of Science. As ever,

he was sporting some headgear, which in this case showed him a sort of chat room full of students back at Georgia Tech. The students watched a live stream from Starner and used the chat room to provide information and ask questions.

This was also shown to the physically present Academy members on a larger display. At first, the students provided information to Starner about what he was discussing and asked questions. Eventually, the

The Twiddler 2 is a full-function keyboard and mouse pointer in one compact unit, operated using only one hand.




members of the Academy began conversing openly and directly with those students, none of whom were actually in the room. In this way, the collective was formed.

But could this be done on Glass? Absolutely, said Starnier, but he isn't confident there's a lot of priority for it:

"One of the academics will do it. The question is whether there's a commercial reason for it. When you make something like this that has a clear focus, has a clear use, stuff that's well-baked, stuff that's compelling — but when that hardware gets out to all my buddies [at universities] you'll see them adapting to some very interesting uses."

And that's where a line may need to be drawn, dividing Starnier's vast experience in wearable technologies and the future of Glass and other derivative devices. In an academic setting, when you actively research something new and contribute to a broader project, you can get away with wearing a backpack full of circuitry while constantly adjusting a weighty pair of glasses on your nose. After all, you're doing it for science.

When it comes to the commercial world, however, to the creation of a profitable and thriving ecosystem used by average people in the average world, the standards are higher. Devices must be smaller, their interfaces must be intuitive and everything must simply work and work simply. From a researcher's point of view, this is an unworkable limitation. From an engineer's point of view, this is a necessary challenge. From a consumer's point of view, this is just the way it is.

In some ways, Glass in its current form is limited compared even to the devices Starnier wore years ago. The real question, of course, is whether it offers enough to finally bring wearables to the mainstream? That remains to be seen, but if it does, remember this: Thad Starnier did it way before it was cool. 

Tim Stevens is Editor-in-chief at Engadget, a lifelong gamer, a wanna-be racer, and a born Vermonter.



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**YODA'S HYPE
MACHINE**



EMMANUEL DUNAND/AFP/GETTY IMAGES

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YODA'S HYPE MACHINE

The Force was strong last week in New York's PR stunt paradise (aka Times Square) as Lego served up a full-scale replica of a *Star Wars* X-wing fighter to promote a new Cartoon Network miniseries called *The Yoda Chronicles*. The ABS spacecraft was comprised of over 5 million clickable bricks and tipped the scales at 45,980 pounds. Master builders at the Lego model shop in Kladno (Czech Republic) spent more than 17,000 hours constructing the craft, paying special attention to engineering so that it could withstand the trip to NYC, a mere stopover on its way to the Legoland California Resort, where it will be on display for the rest of the year.

EMMANUEL DUNAND/AFP/GETTY IMAGES

MARK HATCH



The [TECHSHOP](#) CEO on annoying reboots and the ka-chunk of classic tech

What gadget do you depend on most?
iPhone 5. It allows me to always be on.

Which do you look back upon most fondly?
My Toshiba T1100 Plus running DOS 2.11 with a whopping 640KB

of memory. Configured with a RAM disk and dual floppies... I was all that.

Which company does the most to push the industry?

In our segment I would have to say Autodesk clearly understands the potential of the maker movement, maker spaces and the future of manufacturing best. And they are putting money into the segment faster than any other company.

What is your operating system of choice?

Red Bull.

What are your favorite gadget names?

I've always been partial to "Leatherman."

What are your least favorite?

Dell Inspiron IM5030-3413B3D... It makes the AS400 sound inspired.

Which app do you depend on most?

I live on email of all forms.

What traits do you most deplore in a smartphone?

Siri. And other voice-recognition





Aaron Kuffner's Gamelatron, which merges robotics and Balinese musical tradition, sits on display at TechShop SF.

systems. They're terrible. I used a voicemail service in the late '90s called Wildfire. It rocked. I call on Rich Miner at Google Ventures, who co-founded Wildfire, sold it and moved on, to resurrect it and save us from Siri.

Which do you most admire?

Some people forget how revolutionary visual voicemail was; for those of us who grew up on voicemail and getting stuck with 30 to 100 calls waiting... and no idea who called or why... or what urgency.

What is your idea of the perfect device?

Sox. Perfectly intuitive, allows for self-expression, easy to use and comfortable.

What is your earliest gadget memory?

Electro-mechanical TV channel changer. I loved the sound of the "ka-chunk," as the channel changed.

What technological advancement do you most admire?

I think electricity had the most profound change on the world. Radio technology up through and



“Radio technology up through and including RFID is as close to pure magic as we are likely to ever see (or not see).”

including RFID is as close to pure magic as we are likely to ever see (or not see). The first time a tech described RFID to me, I kept asking where the battery was. He kept saying it didn't need one. Huh? Devices with no power?

Which do you most despise?
Needles.

What fault are you most tolerant of in a gadget?
I used to tolerate configuration and setup issues as just the cost of being an early adopter ... and then I started getting Apple products.

Which are you most intolerant of?
Gadgets that have to be rebooted consistently drive me nuts. Somehow I now have a printer that has to reboot. Really? Shouldn't a printer just work?

When has your smartphone been of

the most help?

This is like asking, “When has your right hand been the most help?” I meet people, get deals done, plan trips, find the nearest hospital, locate a good restaurant.

What device do you covet most?
Gulfstream G550. But I would settle for a HondaJet.

If you could change one thing about your phone what would it be?

I think Samsung is headed in the right direction. The iPhone 5 screen is simply too small. Thankfully I now carry an iPad mini ... but it will not fit in any of my pockets.


What does being connected mean to you?

People who want and need to get to me can, and I can meet with people who I want or need to connect.

When are you least likely to reply to an email?

I've never responded to an email while in the shower.

When did you last disconnect?

I bought my first acoustic coupler around 1985. In 1991, I took a cruise to Mexico; I couldn't connect for two days. It almost killed me. 



IN REAL LIFE is an ongoing feature where we talk about the gadgets, apps and toys we're using in real life.

iPOD CLASSIC

A MONTH OR SO AGO, Engadget Show producer Ben mocked me for my insistence on carrying around my iPod Classic at all times, in addition to my phone. And then the unthinkable happened: I left the thing in a rental car, somewhere in San Francisco. Joni Mitchell said it best: you don't know what you've got till it's gone — granted, she was talking about building parking lots, but it could just as easily apply to wedging your music player be-

neath the passenger seat of a Ford Escape. And yes, I'm a Spotify user, but if we're being perfectly frank here, the site's African highlife selection leaves a bit to be desired. And I probably don't need to tell you, dear reader, about the omission of Flying Nun and Drag City records.

Sure, busting out the player in the Engadget CES trailer was the cause for giggles, with my unwavering devotion to 2007-era tech, but who among you doesn't miss

the tactile feedback of a click wheel? Or a smooth sail through one's library without the hiccups of poor wireless connections? Hey, there's even something to be said for the whir of a tiny 160GB hard drive from deep inside that metal casing. Will I be the guy at the retirement home clutching onto 50-year-old technology as the rest of the world passes me by? Perhaps. Spotify, get some Chance the Rapper and Led Zeppelin records, and maybe we'll talk.

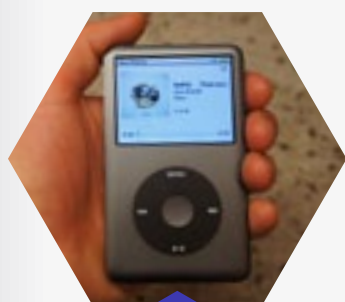
— Brian Heater



WhoSounds
TARDIS
Bluetooth
Speaker



WHOSOUNDS TARDIS BLUETOOTH SPEAKER



iPod
Classic

AS CHILDREN, we spend the bulk of our time vainly trying to reach adulthood. As soon as we've grasped that brass ring, however, we spend the rest of our lives desperate to go the other way. For a few fleeting moments, WhoSounds' TARDIS speaker does the impossible, sending you back to a time when you still hoped that Jonathan Powell would put aside his personal enmity with John Nathan-Turner and reverse the decision to transfer Andrew Cartmel to the BBC's *Casualty*. As soon as I turned this humble plastic Bluetooth speaker

on, the night-light began to flash and the TARDIS noise began to play; I giggled.

Of course, you probably care more about the gadget's technical specifications than any emotional responses it provokes. The pair of 5W (20W RMS) speakers offers clear, clean-sounding audio, while the various controls are neatly stashed away on the rear panel. Thankfully, if you do consign it to your bookshelf, there's a handy remote control that means you won't need to constantly remove it from its place. If you decide you'd prefer it to stand free

on your desk, you can also use its rear-facing USB 2.0 port to charge whatever devices you've got lying around. While plenty of other Bluetooth speaker units do the same job, this was the only one I've been sad to send back after I was finished testing it.

— Dan Cooper



The week that was in 140 characters or less

Pirated Development, Magic Money and Surf's Up (Again)

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REHASHED

@Veronica

I understand, but don't agree with, the self-entitlement that comes with stealing content that's (for now) US only. #arresteddevelopment

@breathlesstao

Seriously, though... apple talking fashion sense... what's next, Samsung selling more devices in Finland than Nokia? ... Oh, wait.

@davidu

Is it always the same person at MSFT who every few years thinks people want to surf the web on their TV, or is it a new one each time?

@JohnPaczkowski

Walt [Mossberg] on Disney MagicBand: "So when I put this on does money immediately begin flowing out of me?" #D11

@tomkrazit

Great question from a woman in the audience: why do the ads on my Facebook feed stereotypically treat me as a woman? Sandberg dodges.

THE STRIP

BY SHANNON WHEELER



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TIME
MACHINES

WHAT IS THIS?
TOUCH TO FIND OUT



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TIME MACHINES

NAGRA II-C

MODERN EQUIVALENT:

Nagra SD Digital
Audio Recorder

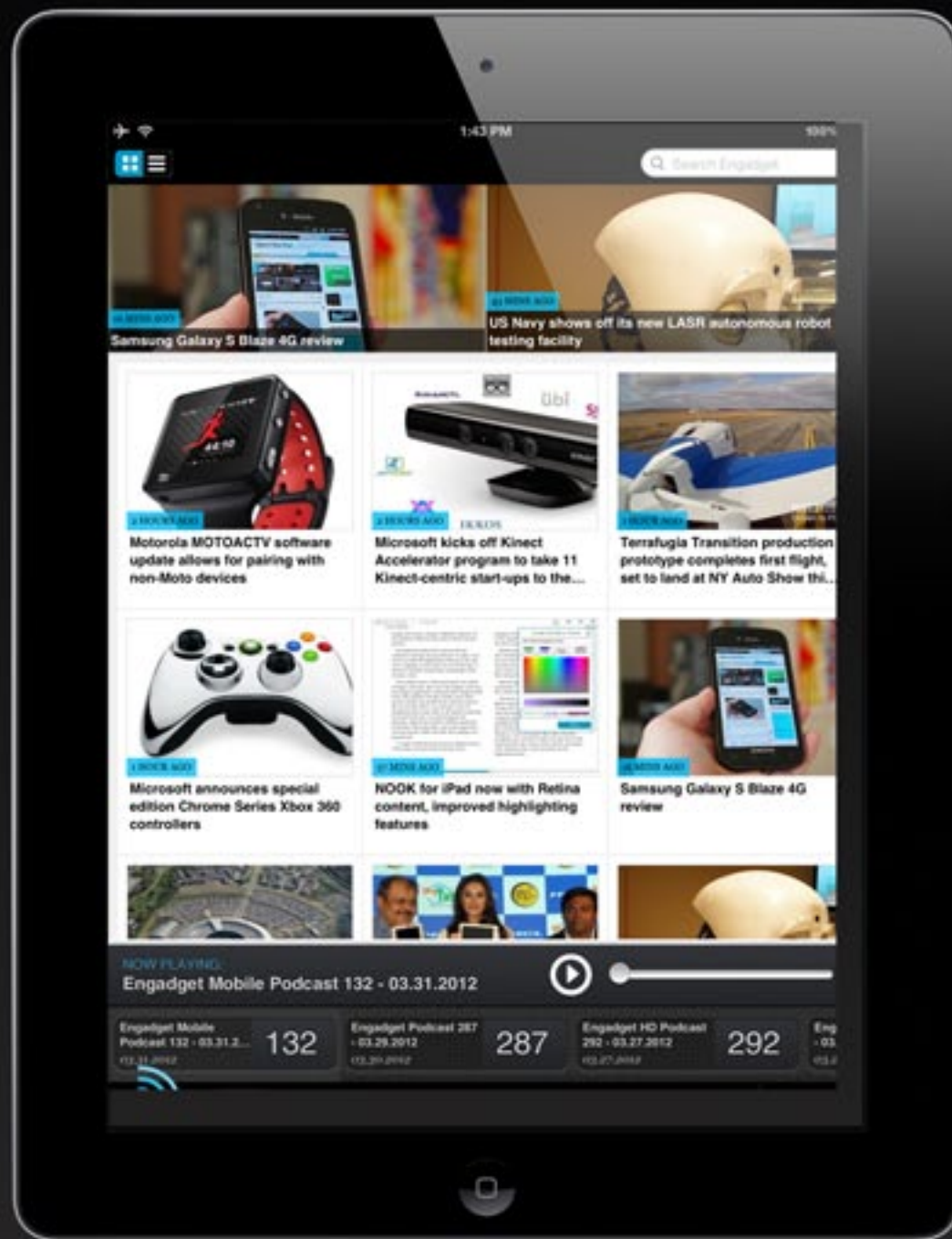


Stefan Kudelski, born in Poland, founded the Kudelski company in 1951 in Lausanne, Switzerland. Its product and his prized invention, the NAGRA (meaning “will record” in Polish) was the first of its kind: a portable, self-contained audio tape recorder that was powered by a wind-up motor and offered high-quality recordings. The NAGRAS were made in-house to avoid manufacturing delays, and around 1955 the II series saw printed circuit boards and standardized microphone jacks among the first of many modifications. The device quickly became popular among reporters and eventually found its way to Hollywood studios, championed by actor / comedian Jerry Lewis. Kudelski's devotion to quality and development made the company a leader in broadcast and cinema recording for decades, and it continues to offer a variety of recording devices for the military, security specialists, audiophiles and journalists.



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